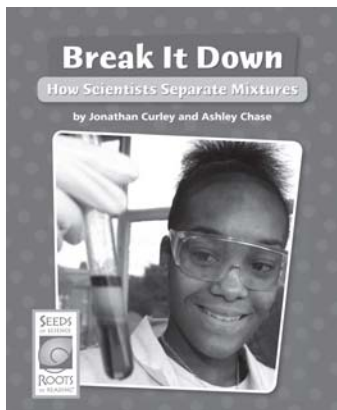


## Using Roundtable Discussions

with *Break It Down: How Scientists Separate Mixtures*  
from *Seeds of Science/Roots of Reading*<sup>®</sup>



### Introduction

This strategy guide introduces an approach for teaching students to discuss ideas using a Roundtable-Discussion format. Roundtable Discussions are student-led, evidence-based conversations about challenging questions. This guide includes an introductory section about Roundtable Discussions, a description of how to conduct Roundtable Discussions in conjunction with many content-rich texts, and a plan for conducting a Roundtable Discussion with the *Seeds of Science/Roots of Reading*<sup>®</sup> book *Break It Down: How Scientists Separate Mixtures*.

### Book Summary

In *Break It Down: How Scientists Separate Mixtures*, readers learn that most objects and materials are mixtures made of different substances. These mixtures can be separated or broken down into their component substances, but this is often difficult to do. Some scientists, however, break mixtures down in order to learn more about them. This book provides three examples of separating mixtures: the separation of salt from ocean water, the separation of plasma from blood, and the separation of the various ingredients in food found in an ancient pot. In each case, scientists use the properties of the individual substances of each mixture to separate them. Scientists then use what they find to solve problems or answer questions.

### About This Book

#### Reading Level

Guided Reading Level\*: R

#### Key Vocabulary

atom, mixture, molecule, property, substance

#### Text Features

bold print, captions, diagrams, glossary, headings, illustrations, labels, photographs, table of contents

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

### Science Background

A substance is matter that is made of one kind of atom or molecule. Gold and water are common substances. Most matter, however, is a mixture of multiple substances. Milk, juice, rock, soap, and bricks are just a few of the countless mixtures we encounter every day. Separating a mixture into its component substances allows scientists to learn more about the mixture and the substances from which it is made. Each substance in a mixture is composed of atoms and/or molecules that have distinct properties. These properties allow scientists to separate mixtures. Scientists use a filter to separate pure water from the mixture of water and salt in ocean water. Scientists use a machine called a centrifuge to separate blood into its solid and liquid parts. By putting the blood in test tubes and spinning the test tubes very quickly, the solid and liquid parts of the blood separate. Chromatography is a technique used in chemistry for separating the components of mixtures. In chromatography, a mixture is passed through a material, such as gel or paper. Different atoms and molecules move through the material at different rates and, thus, separate. Because atoms and molecules have different properties, they are able to be separated through various methods.

## About Roundtable Discussions

Helping students develop facility with academic language is important to their success in school. In content areas such as science, it is particularly critical that students have opportunities to participate in discussions and practice using specialized language. A Roundtable Discussion is a format for student-led, small-group discussions about a topic. This format helps students practice using academic language to discuss key ideas in response to questions. A Roundtable Discussion is also a valuable way to teach students that scientists answer questions based on evidence and discuss ideas with others in the scientific community.

## Using Roundtable Discussions

The following steps can be used to introduce students to the Roundtable Discussion routine using any content-rich book.

- Select a text that is related to your curriculum. Be sure that the text you select introduces a topic and provides many examples or evidence about this topic.
- Develop four questions that will prompt students' thinking about the topic in the text. You may wish to use the copymaster included in this guide to list the questions students will discuss. The following are guidelines to use when writing questions:
  - a. The question should relate to important concepts in the text.
  - b. Students should be able to answer the question using evidence provided in the text.
  - c. The question should prompt students to think deeply about the content of the text.
- Make a class chart that lists the directions for the discussion routine (see the box on this page). On the board, write the four questions you developed.
- Introduce the text you selected and have students read.
- Tell students that they will work in groups of four to discuss what they have read. Explain that the discussion will focus on answering four questions using evidence from the text.
- Organize students into groups of four. Have groups count off, so each student is assigned

## Roundtable Discussion Directions

1. The person who is the leader for question #1 reads the question aloud.
2. The leader asks the group for ideas.
3. Everyone else in the group shares ideas, and the leader takes notes as needed.
4. The leader makes sure that everyone contributes.
5. When everyone has shared ideas, rotate to the next leader and the next question.

a number from 1 to 4. Tell students that their numbers correspond to the number of one of the questions on the board. Explain that each student will lead a discussion about this question.

- Use the Roundtable Discussion Directions chart to explain how the discussions will work. Tell the class that after reading the first question aloud to his group, the discussion leader will invite the other members of his group to share ideas and supporting evidence. As other students in the group share, the leader should listen to everyone's ideas and encourage participation. Leaders can take notes on the discussion if they wish; these notes will help the leader report to the class after the group discussion.
- Explain that after question 1 has been discussed, group members will rotate to the next question and the next leader, so that everyone has a chance to lead a discussion.
- Before students begin discussing, you may wish to model facilitation skills, such as listening respectfully to the person who is speaking, making sure everyone has the chance to share, and using evidence to support ideas.
- Allow time for students to conduct their Roundtable Discussions.
- After groups discuss each question, have each discussion leader tell the class what her group said in response to her question. You may wish to record ideas on the board as students share.
- Debrief the Roundtable Discussions. Emphasize how students used evidence from the text to support their ideas.

## Using a Roundtable Discussion with *Break It Down: How Scientists Separate Mixtures*

*Break It Down: How Scientists Separate Mixtures* prompts students to think about what a mixture is, the methods scientists use to break down mixtures into their component parts, and what scientists learn in the process.

### Getting Ready

1. Write the four questions below on the Roundtable Discussion copymaster and make a copy for each student.
  - In what ways can separating mixtures be useful? [Pages 10, 12, 17.]
  - Which properties allowed the water, plasma, and ancient stew molecules to be separated from the mixtures they were a part of? [Pages 11, 13, 18.]
  - How does gas chromatography work? [Pages 18–19.]
  - How might a scientist separate air pollution from the air? [Different methods are found on pages 11, 19, and 22–23].
2. Make a class chart titled Roundtable Discussion Directions (see the box on the previous page) and post it in a visible place.

### During Class

1. Let students know that *Break It Down* is a book about mixtures (matter that is made up of more than one substance) and ways that scientists break down mixtures into their component parts.
2. Read the book in a way that is consistent with your classroom routines, giving students as much independence as possible.
3. Tell students that they will be working in groups of four to discuss what they have read. Explain that each person in the group will take a turn leading part of the conversation. The discussion will focus on answering four questions using evidence from the book.
4. Organize students into groups of four and distribute the Roundtable Discussion student sheets. Have groups count off so each student is assigned a number from 1 to 4. Tell students to circle their assigned number on their student sheets, which corresponds to the question they will present as discussion leader.
5. Share the Roundtable Discussion Directions chart and explain how the discussions will work. First, explain that for each question, the student assigned that number will lead the discussion for that question.
6. Explain that the first discussion leader will read her question aloud to her group. The leader should then invite the other members of the group to share ideas and support them with evidence. As students in the group share ideas, the leader should write down a few notes on her student sheet. The notes will help students report to the class after their group discussions.
7. Model discussion facilitation skills, such as listening respectfully to the person who is speaking, making sure everyone has the chance to share their thinking, and using evidence to support ideas. Point out the questions at the bottom of the student sheet. Encourage leaders to use these questions to help others participate and elaborate on ideas.
8. Allow time for groups to conduct their Roundtable Discussions. You may need to prompt students to rotate to the next question and next discussion leader.
9. After groups discuss each question, regain the attention of the class. Choose a discussion leader for each question to share the evidence their groups discussed. Record students' ideas on the class chart as they share.
10. Debrief the Roundtable Discussions with the class, emphasizing how students used evidence from the text to support their ideas.

### Independent Extension

Have students write a summary of the ideas presented in the discussion. They can use their notes for this purpose. Have students write paragraphs explaining the answers to their assigned questions, using evidence that others shared from *Break It Down* to support their responses.

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

## **Roundtable Discussion**

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

Circle the number that you were assigned. You will be the discussion leader for the question next to that number.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_

As your group discusses your question, write down notes below.

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### **Questions to Ask Your Group**

- What do you think?
- Why do you think that?
- What is your evidence?
- What does the evidence tell us?

## About Strategy Guides

A six-page strategy guide is available for each *Seeds of Science / Roots of Reading*<sup>®</sup> 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 4–5

Nine engaging student books are now available from *Models of Matter* and *Chemical Changes*, each with a corresponding strategy guide. The books are part of the *Seeds of Science / Roots of Reading*<sup>®</sup> curriculum program described on page 6. Eighteen student books from the remaining grade 4–5 units (*Planets and Moons* and *Aquatic Ecosystems*) are currently in development and will be available in spring and summer 2010.

<i>Chemical Changes</i>	
Strategy	Student Book
Teaching Scientific Explanation Writing	<i>Chemical Reactions Everywhere</i>
Posing Investigation Questions	<i>Handbook of Chemical Investigations</i>
Teaching Text Structure	<i>What Happens to the Atoms?</i>
Teaching Procedural Writing	<i>Bursting Bubbles: The Story of an Improved Investigation</i>
Promoting Word Consciousness	<i>Communicating Chemistry</i>
<i>Models of Matter</i>	
Strategy	Student Book
Teaching Summary Writing	<i>Made of Matter</i>
Using Roundtable Discussions	<i>Break It Down: How Scientists Separate Mixtures</i>
Interpreting Visual Representations	<i>Phase Change at Extremes</i>
Teaching About How Scientists Make Inferences	<i>Science You Can't See</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](http://www.seedsofscience.org)



### *Models of Matter* 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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