

## Making Sense of Data in Science Texts

with *What's Going on with the Weather?*  
from *Seeds of Science/Roots of Reading*®



### Introduction

This strategy guide introduces an approach for teaching students to make sense of data presented in science books. The ability to interpret data is particularly important in science, where information is often communicated and summarized visually in tables, graphs, maps, and diagrams. This guide includes an introductory section about the strategy of making sense of data, a general overview of how to teach this strategy with many science texts, and a plan for teaching students to make sense of data with the *Seeds of Science/Roots of Reading*® book *What's Going on with the Weather?*

### Book Summary

*What's Going on with the Weather?* is a realistic story about the investigations a young girl named Toby conducts after she moves from Boston to San Francisco. As Toby begins life in a new city, she notices that the summer weather in San Francisco is quite different from the summer weather in Boston. She wonders if it will be cool and cloudy all the time in San Francisco and how hot San Francisco can get in the fall. Toby's older brother, Max, helps her find weather data to answer each new question. Together, Toby and Max make sense of the data to learn about the weather patterns in both San Francisco and Boston. They compare the weather patterns in the two cities and make predictions about how the weather will impact their lives.

### About This Book

#### Reading Level

Guided Reading Level\*: N

#### Key Vocabulary

analyze, data, graph, precipitation, temperature

#### Text Features

bold print, glossary, graphs, illustrations, maps, tables

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

### Science Background

*Weather* is a term used to describe anything that happens in the atmosphere related to temperature, water, and air. The scientific study of weather is called meteorology. Meteorologists observe and measure weather conditions and use these data to describe weather patterns. Data that meteorologists collect include humidity, precipitation, and daily high and low temperatures. Averaging these data over many years can provide a picture of the typical weather in a given location. When analyzing precipitation data, such as the data presented in *What's Going on with the Weather?* meteorologists have a special system for dealing with snow measurements in order to make them comparable to rain measurements. The snow-to-liquid equivalent is the amount of liquid precipitation produced after snow melts. For example, ten inches of snow may represent only one inch of liquid water (the exact ratio depends on how dense the snow is). This system provides a way to compare precipitation in months when there is rain to precipitation in months when there is snow. Precipitation and other weather data is often organized in tables or graphs, which can help scientists make comparisons, look for patterns, and communicate their results.

## About Making Sense of Data in Science Texts

Information in science texts is often communicated using formats such as tables, graphs, maps, and diagrams. These formats, also known as data representations, are commonly used in content-rich texts to present large amounts of information in a concise manner. Data representations organize information, draw attention to relationships, and explain information that is difficult to describe in words. The ability to make sense of data is particularly essential in science texts because these texts often rely on data representations to convey important concepts.

## Teaching Students to Make Sense of Data in Science Texts

The following guidelines can be used to teach students how to make sense of data in any content-rich text that contains visual representations of data.

- Begin by choosing one format of data representation on which to focus, such as tables, graphs, maps, or diagrams. Find a text that includes data presented in the format you have chosen.
- Have students examine the data in the text. Ask them to describe what they notice about the way the information is presented. For example, they may observe that tables have rows and columns. (See the box on this page for examples of common features of each format.)
- Demonstrate how to interpret data organized in the selected format. Think aloud as you interpret a table, graph, map, or diagram and refer to the features you have pointed out. Present some sample questions that can be answered with the data presented. Demonstrate how to use the table, graph, map, or diagram to answer the questions.
- Invite students to share conclusions that they can draw from the data. Ask questions such as, “What do you notice?” “What can you tell from this (table, graph, map, diagram)?” Pose questions that encourage students to draw conclusions from the data presented. When

## Features of Data Representations in Science Texts

**Tables:** title, row labels, column labels, the way in which each cell refers to a column and a row

**Graphs:** title, labels, key, axes

**Maps:** title, labels, key, scale

**Diagrams:** title, labels, key, symbols (such as arrows)

eliciting responses, invite students to explain which information they considered in order to arrive at their answers.

- Discuss the purpose of organizing data in the chosen format. Ask students why authors (and scientists) might use this particular format to present information.
- After students have learned about several formats for representing data, guide them toward making comparisons between features that are similar or different across the various representations. For example, point out that both graphs and maps usually include a key to help the reader understand the meaning of colors or symbols.
- Guide students in using different formats to organize and represent information based on data that you gather in class. For example, you might gather data about students’ preferences for ice-cream flavors or about weather patterns over several days. You may wish to use the Data Table copymaster included in this guide.
- You might also consider reorganizing data from a familiar text in a new format and talking about how the two representations are different.
- After students are familiar with several ways that data is represented in text (tables, graphs, maps, and diagrams), invite them to include these formats in their expository writing.

October Temperatures in San Francisco	
Temperature range	Number of days
80–89°F	3
70–79°F	6
60–69°F	17
50–59°F	5

## Making Sense of Data in *What's Going on with the Weather?*

### Getting Ready

1. Create a data table using the example above. Write the title “October Temperatures in San Francisco,” label the left column “Temperature range,” and label the right column “Number of days.” (You will fill in the rest of the table with students during class.)
2. Make a copy of the Data Table copymaster for each student.

### During Class

1. Introduce *What's Going on with the Weather?* and explain that it is a book about a girl who is surprised by the weather when she moves from Boston, Mass., to San Francisco, Calif.
2. Read the book in a way that is consistent with your classroom routines, giving students as much independence as possible. After reading, briefly discuss the text to be sure students understand the main ideas.
3. Point out to students that each time Toby has a new question about the weather, she looks for information, or data, to answer it. Tell students that they will analyze some of the data in the book, just as Toby did.
4. Have students turn to page 9. Point out that the data is represented as a graph. Ask students what the graph shows. [Average monthly high temperatures in San Francisco.] Ask which months have the highest temperatures in San Francisco. [September, October.]
5. Explain that data can be organized in different ways, depending on what the author wants to show. Ask students to turn to page 13. Point out that the data on this page is organized in a different way—in a table. Ask students to think about how the data table on page 13 is different from the graph on page 9.

6. Have students organize some of the data from the book in a new way in order to answer a question. Ask students to use the data table on page 13 to answer Toby’s question on page 11: “How hot can San Francisco get in October?”
7. Post the October Temperatures in San Francisco chart you made before class and distribute a copy of the Data Table student sheet to each student. Point out the title and column headings on the chart and have students record the title and headings on their student sheets to match the class chart.
8. Demonstrate how to create a temperature range (e.g., representing temperatures in the eighties as 80–89°F) and record this information on the chart in the “Temperature range” column. Then, ask students to figure out and record the number of days the temperature was between this range in October 2008. [Three.]
9. Ask students what other temperature ranges they notice in the data table on page 13. [50s, 60s, 70s.] Guide students to create temperature ranges for these temperatures [50–59°F, 60–69°F, 70–79°F.] Record these on the class chart and ask students to record them on their student sheets.
10. Have students complete the remainder of their data tables with a partner by counting the number of days the temperature fell within each range.
11. Discuss how creating a table is useful for making sense of data. Ask, “What can we learn from our data table about the temperature in October in San Francisco?”
12. After the discussion, direct students to write a brief description (on the lines below the table on their student sheets) about what they learned from the data.

### Independent Extension

Invite students to use the graphs on page 17 in *What's Going on with the Weather?* to answer more of Toby’s questions. Direct students’ attention to the questions on pages 14 and 16 of the book: “Is it ever going to rain in San Francisco?” and “When does it rain the most in Boston?” Have students discuss their answers with a partner or write about them.

Name \_\_\_\_\_

Date \_\_\_\_\_

## Data Table

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

Record your information in this table.

<b>Title:</b>	

---

---

---

---

---

---

---

---

---

---

---

## 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)).

## Student Books for Grades 3–4

Twenty-seven engaging student books are 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.

<b>Digestion and Body Systems</b>	
<b>Strategy</b>	<b>Student Book</b>
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>
<b>Variation and Adaptation</b>	
<b>Strategy</b>	<b>Student Book</b>
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>
<b>Weather and Water</b>	
<b>Strategy</b>	<b>Student Book</b>
Teaching About the Nature and Practices of Science	<i>Tornado! A Meteorologist and Her Prediction</i>
Teaching About Multiple Meaning Words	<i>Falling Through the Atmosphere</i>
Gathering Information from Science Texts	<i>Weather Encyclopedia</i>
Teaching Text Structure	<i>Water in the Desert</i>
Using the Cognates Strategy	<i>Drinking Cleopatra's Tears</i>
Connecting Science Words and Everyday Words	<i>Go with the Flow: Making Models of Streams</i>
Taking Notes Based on Observations	<i>Sky Notebook</i>
Teaching Text Features	<i>Wet Weather Handbook</i>
Making Sense of Data in Science Texts	<i>What's Going on with the Weather?</i>
<b>Light Energy</b>	
<b>Strategy</b>	<b>Student Book</b>
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>

