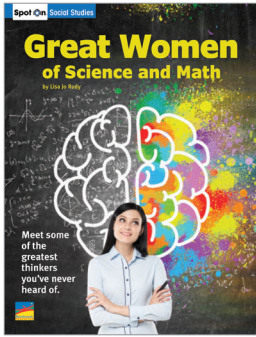


Great Women of Science and Math



Genre: Informational Text

Text Level: 0/34

Lexile®: 800L

Word Count: 2,710

Additional Materials

- Level N–O–P Informational Prompting Card
- Self-stick notes

Summary

Women have been involved in math and science throughout history, but many women's contributions have been overlooked. Women have made important contributions to the three branches of science—life science, Earth science, and physical science.

Learning Goals

- Summarize and synthesize.
- Draw inferences and discuss key ideas.
- Apply Level O reading behaviors.

Responsive Teaching: Small-Group Reading

Based on your observational notes and progress-monitoring oral reading records, identify specific behaviors you want to support with each student. Use the language on the Level N–O–P Informational Prompting Card to scaffold their development.

Session 1: Build Reading Behaviors

Focus (2 min.)

Engage

Introduce the book to help students engage with meaning and activate strategies. Have students preview the book on their own.

- *Read the statement on the front cover: "Meet some of the greatest thinkers you've never heard of." What do you predict you'll read about?*

Invite students to discuss the text's structure and features. Tell students that you will read the introduction, Chapter 1, and Chapter 2 during group, and they will read Chapter 3, Chapter 4, and the conclusion during independent time.

Build Social and Emotional Mindfulness

Help students build social awareness by examining women's impact on science and their lack of acknowledgment.

- *You're going to learn about women in math and science. As you are reading, think about how women might have done more if their work had been more acknowledged.*

EL Vocabulary Support for English Learners

- Explain that the verb *to face* on page 2 means "to bravely deal with challenges." You may also want to explain *acknowledge* and *accomplishment* (page 8).
- Pre-teach vocabulary. Help students decode unknown words using letter patterns, syllabication, word parts, or context clues.

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Model (2 min.)

Comprehension Strategy

You may wish to model the same strategy or skill you taught during the reading mini-lesson or another previously taught one, depending on the needs of your readers. If possible, use an existing anchor chart to support your modeling.

The following are some suggested strategies for this book:

- Summarize and Synthesize
- Explain Author's Purpose and Message
- Determine Text Importance
- Identify and Use Affixes

Sample Modeling: Summarize and Synthesize

- Read aloud the first three paragraphs of Chapter 1. Go over the chart on page 4. Model taking notes of the main ideas.
- *A summary of the important things in this text is "Science's three main branches are life science, Earth science, and physical science. Each area studies different things."*

Adria Klein

Scaffold instruction, lower the cognitive load, focus and differentiate the lesson, but don't lower the demands, the grade level standard's target, or water down the materials.



Guide Practice (5–6 min.)

Read

Students will silently read the text independently.

* Refer to the Level N–O–P Informational Prompting Card and be mindful to watch for the specific indicated behaviors.

You may use the provided prompts prescriptively as you coach individual students during the reading of the text.

The table is titled "Level N-O-P Informational Prompting Card" and is organized into four columns: Behaviors to Look For, Demonstrate, Prompt, and Validate. Each column contains specific instructions and examples for coaching students.

Behaviors to Look For	Demonstrate	Prompt	Validate
Use context clues and/or a glossary to determine the meaning of words or phrases.	Use a glossary to find the meaning of a word or phrase.	"What does the word 'photosynthesis' mean?"	Use a glossary to find the meaning of a word or phrase.
Use details presented in a variety of graphics (illustrations) to support understanding of new information.	Use a diagram to explain a process.	"What does this diagram show?"	Use a diagram to explain a process.
Ask questions to call when reading.	Ask a question about the text.	"What do you think about...?"	Ask a question about the text.
Remain open to new information and adjust understanding.	Adjust understanding based on new information.	"How does this change your understanding?"	Adjust understanding based on new information.
Use knowledge of word structure (prefixes, suffixes) and affixes to solve unfamiliar words.	Use a prefix to form a new word.	"What does the prefix 'un-' mean?"	Use a prefix to form a new word.

Level N–O–P Informational Prompting Card

Scaffold Reading Behaviors

Validate

Based on your observations during reading, quickly validate a reading behavior you saw students use. (See the Validate prompts on the Prompting Card.) Allow students to share how they used the strategy.

Demonstrate

Focus on a level-appropriate reading behavior you did not observe students use (see the Behaviors to Look For on the Prompting Card), and provide quick modeling of the behavior.

* Please note that Prompting Cards do not accompany all purchase options available for this title.

Discuss the Text (3–5 min.)

Revisit Inferences and Discuss Key Ideas

Discuss students' before-reading inferences and the book's key ideas. If possible, refer them to an existing anchor chart.

- *Let's look back at the statement on the cover. What predictions did you make based on the statement? Were the ideas you had about the book correct?*
- *Turn to your shoulder partner, and describe something you learned about life science.*

Continue this brief discussion, guiding students to provide key understandings.

Build Social and Emotional Mindfulness

Help students build social awareness. Ask students to consider how women who were unappreciated and unacknowledged for their scientific discoveries most likely felt. Have students discuss how women in science might have accomplished more if they had been better acknowledged.

EL Support for English Learners

- You may want to do a quick think-aloud with students to remind them how to make inferences or identify key ideas.
- Before partner discussions, check students' understanding of life science fields and careers and practice pronouncing them. Provide sentence frames as needed.

Sample Share

- *One thing I learned about life science is that some life scientists study ocean life. Scientists use tools to help them explore the ocean and the life living in it. Sometimes they even have to invent their own tools to help them explore. I think this is interesting because scientists often have to overcome obstacles to do their work.*

Discussion Sentence Frames

- *One thing I learned about life science is _____. I think this is interesting because _____.*

Share, Reflect, and Transfer (2 min.)

Apply the Strategy

Work with students to apply the reading strategy you modeled. Encourage them to practice transferring this strategy and/or behavior to their independent reading.

Linda Hoyt

A one-minute partner chat before group sharing begins ensures that all students will engage in conversation. Be prepared to reteach the strategy if necessary.



Sample Strategy Application: Summarize and Synthesize

- *As you read on, take notes to record the important points of each chapter. Use your notes to make a summary in your own words. Combine the ideas in your summary with what you already know.*

Discuss the Rest of the Book (6–8 min.)

- You finished reading the book during independent reading time. Think about Chapter 3: “Women in the Earth Sciences.” What is an inference you can make based on the chapter?

Allow students to refer to the text for evidence that supports their comments as the rest of the group follows along.

Continue the Discussion

- Repeat this process with Chapter 4: “Women in the Physical Sciences.”

Build Fluency (2 min.)

Teaching Focus: Sentences That End in Question Marks

Remind students that different types of sentences require different inflections. Remind students that interrogative sentences, or questions, end with question marks. Read a sentence from the text that ends in a question mark. Ask students how the question mark affected the way you read the sentence.

Sample Sentence

- page 18: “What interests physical scientists?”

Process Meaning Through Writing (5–6 min.)

- The book includes many important scientific discoveries and contributions. Which scientific discovery or contribution was most interesting? Why did you find it interesting?

Have students point to the section of the text that describes the discovery. Allow one or two students to briefly explain why they thought that discovery was so interesting. Then have students write.

EL Writing Support for English Learners

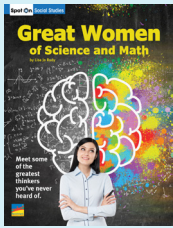
- Write examples of discoveries from the text (e.g., the invention of the computer) on the board. Have students choose a discovery and identify three or four key words in the text that help explain why they find it interesting. Then have them work in pairs and explain why the discovery is interesting. Provide sentence frames, if necessary: *In my opinion, ___ is the most interesting discovery. I find it interesting because ____.*

Student Writing Task

- In your reader’s notebook, I want you to write two sentences about the discovery or contribution you find most interesting. Explain why the discovery or contribution is interesting to you.
- Allow students to begin work at the teacher table. Students can finish the assignment at their desks.

Progress Monitoring

You might plan to have one or two students stay behind from the group for a progress-monitoring oral reading record. Have the students read page 2 and the first two paragraphs on page 3, from “The natural” to “explorers,” for a total of 106 words. Record your observations on the Oral Reading Record Form and use the Oral Reading Record Analysis Form for Levels N/30–Z/80.



The questions on this card ask students to apply these text-dependent strategies:

- Use Text Evidence to Explain Key Details or Draw Inferences
- Determine Main Idea and Summarize
- Explain Connections Between Events or Ideas
- Determine the Meaning of Words and Phrases
- Explain and Interpret Information Presented in Multimedia and Graphic Features
- Explain How an Author Uses Reasons and Evidence

Great Women of Science and Math

Levels: O/34

Lexile®: tk

Ways to Use This Card

The reproducible questions on this card provide opportunities for students to read, analyze, and answer questions by finding text evidence. These questions reflect the item types students will encounter on new standardized reading assessments.

Guided Practice Build on the scaffolded close reading lessons in the teacher's guide, and work with students in small groups to answer these questions, providing support as needed to help them reread and identify text evidence.

Independent or Partner Practice Copy, cut out, and distribute the questions. Have students work independently or with a partner to answer assigned questions and respond in one of the following ways:

Annotate the Text	Have students use self-stick notes to mark text evidence and make other notations.
Annotate the E-Book	Have students use the highlighting and sticky note tools to respond to the question.
Write Answers and Evidence	Have students prepare written responses to questions or respond using a graphic organizer.
Respond Orally	Meet with students individually or in a small group and ask them to explain their answers and the evidence they used.

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1 Great Women of Science and Math

Spot On

How does the time line on pages 2 and 3 help support the text on those pages?

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2 Great Women of Science and Math

Spot On

What can readers tell about the relationship between math and science from the text?

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3 Great Women of Science and Math

Spot On

Read this sentence from page 5. Scientists in each branch use mathematics. Which detail from the text supports this idea?

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4 Great Women of Science and Math

Spot On

What is the meaning of the word *organism* on page 6? Which context clues help you understand the meaning of the word?

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5 Great Women of Science and Math

Spot On

Why did Sylvia Earle invent a suit that allowed her to walk on the bottom of the ocean?

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6 Great Women of Science and Math

Spot On

What is the main idea of the section “Ruby Hirose Studies Germs”?

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7 Great Women of Science and Math

Spot On

What is the meaning of the word *outstanding* on page 20? What context clues help you understand the meaning of the word?

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8 Great Women of Science and Math

Spot On

What can readers infer about Katherine Johnson? Which sentences from the text support that inference?

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9 Great Women of Science and Math

Spot On

Read this sentence from page 22. More of their contributions are being acknowledged. How does the author support this claim on page 3?

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10 Great Women of Science and Math

Great Women of Science and Math

What is a summary of the text?

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Answers for Text Evidence Questions

- 1. Interpret and Use Information in Different Formats:** How does the time line on pages 2 and 3 help support the text on those pages?
Answer: The time line supports the text because it lists famous female scientists and their achievements, and the text states that many women have contributed to the fields of math and science.
Explain and Interpret Information Presented in Multimedia and Graphic Features (DOK 2)
- 2. Explain Connections:** What can readers tell about the relationship between math and science from the text?
Answer: Science depends on math.
Text Evidence: "Life scientists often use math in their pursuit to better understand living things." (p. 5) Earth scientists also use math. For example, they might calculate the wind speed, analyze the density of lava, or measure snowfall." (p. 6) "Physical scientists also use math. For example, they might program computers to complete multiple calculations." (p. 7)
Explain Connections Between Events or Ideas (DOK 2)
- 3. Use Text Evidence:** Read this sentence from page 5. Scientists in each branch use mathematics. Which detail from the text supports this idea?
Answer: "For example, they may use math to measure growth of certain animals over a period of time. They might also present their findings in graphs and charts." (p. 5)
Use Text Evidence to Explain Key Details or Draw Inferences (DOK 2)
- 4. Use Context Clues:** What is the meaning of the word *organism* on page 6? Which context clues help you understand the meaning of the word?
Definition: living thing
Text Clues: "once lived" (p. 6)
Determine the Meaning of Words and Phrases (DOK 2)
- 5. Explain Connections:** Why did Sylvia Earle invent a suit that allowed her to walk on the bottom of the ocean?
Answer: She wanted to learn more about creatures in the sea.
Text Evidence: "Earle wanted to better understand undersea life. So, she helped to invent new machines to explore the ocean. Earle invented an underwater suit. The suit allowed her to walk on the bottom of the sea." (p. 9)
Explain Connections Between Events or Ideas (DOK 2)
- 6. Determine Main Idea and Key Details:** What is the main idea of the section "Ruby Hirose Studies Germs"?
Answer: Ruby Hirose overcame unfair treatment to make important discoveries about germs and illness.
Text Evidence: "Ruby Hirose was a life scientist." (p. 12) "When she was young, few girls were encouraged to study science. In addition, Japanese Americans were discriminated against. Because of these things, Hirose had to work through many obstacles to become a successful scientist." (p. 12) "When Hirose became a scientist, she decided to study germs." (p. 12) "She wanted to prevent sickness." (p. 12) "Hirose completed research on polio." (p. 13) "Several major scientific organizations have credited Hirose for her contributions." (p. 13)
Determine Main Idea and Summarize (DOK 2)
- 7. Use Context Clues:** What is the meaning of the word *outstanding* on page 20? What context clues help you understand the meaning of the word?
Definition: very noteworthy
Text Clues: "By age ten, Johnson was a freshman in high school." (p. 20) "was noticed" (p. 20) "That is because of the complex calculations they did by hand." (p. 20)
Determine the Meaning of Words and Phrases (DOK 2)
- 8. Draw Inferences:** What can readers infer about Katherine Johnson? Which sentences from the text support that inference?
Answer: Readers can infer that Katherine Johnson was intelligent and hardworking.
Text Evidence: "By age ten, Johnson was a freshman in high school." (p. 20) "She was noticed for her outstanding math skills. Later, she graduated from West Virginia State University." (p. 20) "Glenn requested that Johnson personally check the calculations for his landing before he took off for space." (p. 21) "In 1969, Johnson did math that helped Americans land on the moon. She also did math to help send the Space Shuttle into orbit." (p. 21)
Use Text Evidence to Explain Key Details or Draw Inferences (DOK 3)
- 9. Explain Arguments:** Read this sentence from page 22. More of their contributions are being acknowledged. How does the author support this claim on page 3?
Answer: by giving an example of one way women are having their contributions acknowledged
Text Evidence: "Today, women win many math and science awards." (p. 3)
Explain How an Author Uses Reasons and Evidence (DOK 3)
- 10. Summarize:** What is a summary of the text?
Answer: Women have made important contributions to the three main branches of science, which include life science, earth science, and physical science. For example, women in life science have studied ocean life and germs. Women in Earth sciences have identified moons on other planets. Women in physical science have calculated flight paths to space. Women's contributions have not always been recognized. However, more women are being honored for their work.
Text Evidence: "In the past, girls had to fight to be allowed to study science and math in school." (p. 2) "In the past, fewer women became scientists than they do today. Or if they were scientists, their work was not always acknowledged." (p. 8) "Sylvia Earle is a life scientist." (p. 9) "Ruby Hirose was a life scientist." (p. 12) "When she was young, few girls were encouraged to study science." (p. 12) "Several major scientific organizations have credited Hirose for her contributions." (p. 13) "Rosaly Lopes is a volcanologist." (p. 15) "Adriana Ocampo is a planetary geologist." (p. 16) "Bernardine Dias is a physical scientist." (p. 19) "Katherine Johnson is a physical scientist." (p. 20) "While at NASA, Johnson completed calculations that helped launch American astronaut John Glenn into space." (p. 21) "Women have always contributed to science and mathematics, whether their efforts were recognized or not. In recent years, more women have been able to explore careers in science." (p. 23)
Determine Main Idea and Summarize (DOK 2)