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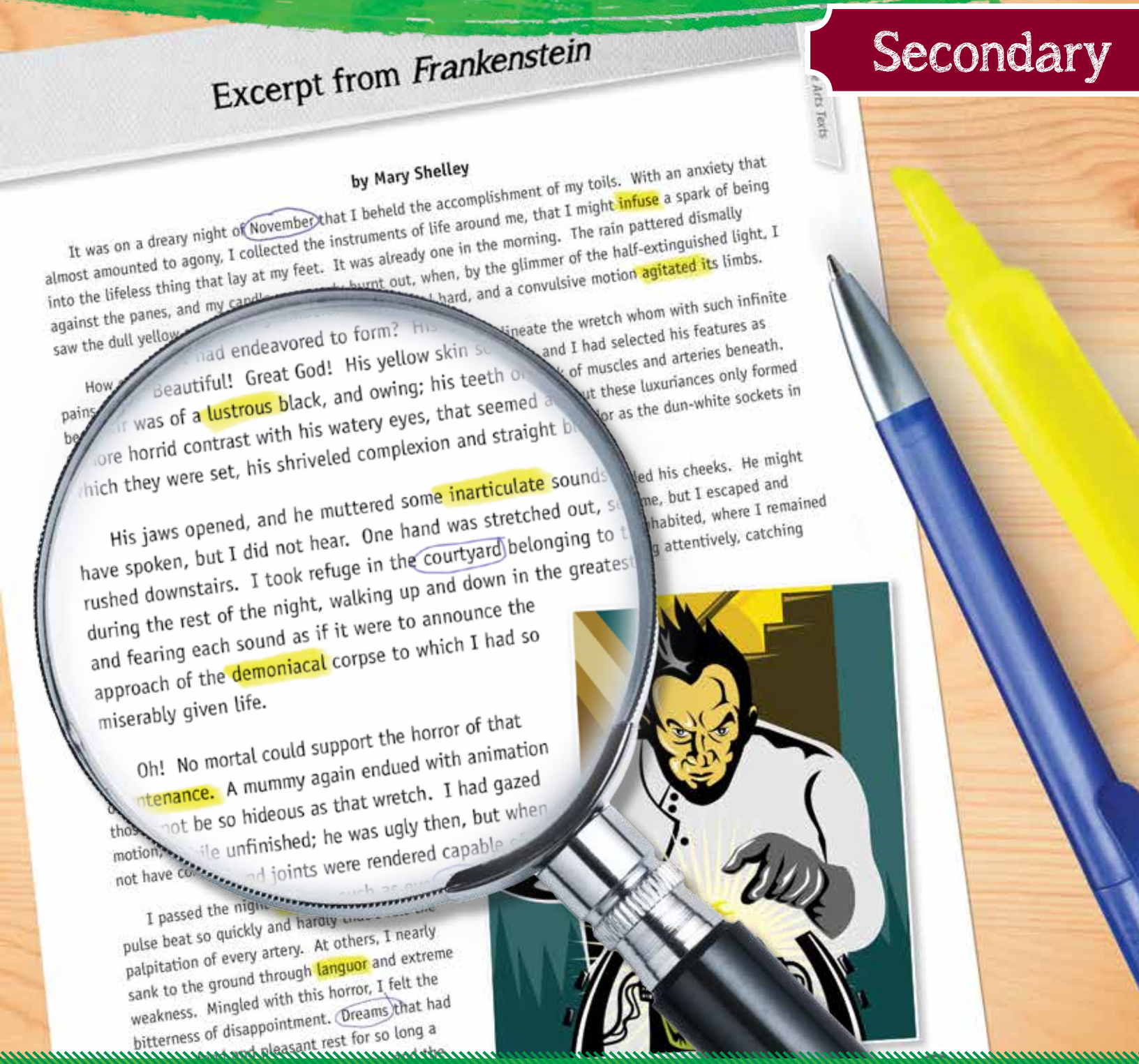
SHELL EDUCATION

Close Reading with Paired Texts

Secondary



Lori Oczkus and Timothy Rasinski

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Radiation

Theme Summary

Radiation is a dangerous energy that, when used properly, offers much to the world. In these paired texts, students will read about Marie Curie and her work as a scientist. They will also read a poem that expresses how Curie's work affected a family.

Standards

- Analyze in detail how a key individual, event or idea is introduced, illustrated, and elaborated in a text (e.g., through examples or anecdotes).
- Determine a theme or central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.
- Understands major discoveries in science and medicine in the first half of the 20th century (e.g., those made by Curie, Einstein, Freud) and how they affected the quality of life and traditional views of nature, the cosmos, and the psyche.

Materials

- *Marie Curie* (page 75)
- *"Marie Curie" Response* (page 76)
- *A Moment of Radiation* (page 78)
- *"A Moment of Radiation" Response* (page 79)
- *Let's Compare! Helpful and Harmful* (page 80)
- *Thinking About Radiation* (page 81)

Comparing the Texts

After students complete the lessons for each text, have them work in pairs to reread both texts and complete *Let's Compare! Helpful and Harmful* (page 80). Finally, students can work to complete the *Thinking About Radiation* matrix (page 81). The matrix activities allow students to work on important literacy skills of reading, writing, vocabulary, and fluency.

Answer Key

"Marie Curie" Response (page 76)

1. A. energy
2. We use radiation today to treat cancer, kill bacteria in food, and to determine the ages of fossils.
3. Working with radiation is dangerous and can make people sick. Curie's study of radiation eventually made her sick, and she died.
4. Curie discovered how to use radiation to treat cancer. She discovered that radiation could keep food from spoiling, detect smoke, and contribute to the study of dinosaur bones.

"A Moment of Radiation" Response (page 79)

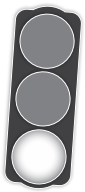
1. C. Curie's work ended up killing her.
2. In Curie's time, it was not common for women to be scientists. People may have thought she was not capable enough.
3. The author is mostly concerned with the health of her mother and how Curie's work is saving her life.

Let's Compare! Helpful and Harmful (page 80)

- Helpful: used to treat cancer, used in smoke detectors, used to study dinosaur bones, kills organisms that spoil food, can detect weaknesses in bridges
- Harmful: exposure can cause cancer, can weaken eyesight, can burn skin, used to make atomic bombs

Nonfiction Text Teacher Notes

Marie Curie

	Lesson Steps	Teacher Think Alouds
 **Ready, Set, Predict!**	• Provide the text for students, and project a larger version for the class to see. • Invite students to pair up to discuss the title and headings. Ask students to predict the ways she was an important scientist, how she discovered radium, and what happened in her final years.	
 **Go!**	• Ask students to read the text independently, underlining scientific concepts that are new to them. • Read the text aloud, modeling fluent reading. Pause briefly before reading italicized words for emphasis.	"There are two italicized words in the text. I want to emphasize these when I read them aloud, so I will briefly pause before reading them."
 **Reread to Clarify**	• Have students reread the text, underlining any parts or words that are confusing. • Have students revisit the new concepts they underlined to clarify their understanding. Then, have students share their thoughts in teams about the new concepts.	"I've heard of *radiation* being used to cure cancer, but I didn't realize how dangerous it was."
 **Reread to Question**	• Have students work in pairs. Then, ask students to reread the text to question. Instruct them to write questions about radium, radiation, or the uses of radiation. Have students work together, reading through the text again to find text evidence that answers their questions. • Have students respond to the questions and prompts on page 76.	
 **Reread to Summarize and Respond**	• Instruct students to reread the text to analyze how the author introduces Curie and elaborates on her accomplishments with examples. Draw stars beside each. Direct them to write summaries based on their analyses.	

***Note:** For more tips, engagement strategies, and fluency options to include in this lesson, see pages 122–128.

Marie Curie

By Elizabeth Cregan and Dona Herwick Rice

Marie Curie is one of the most brilliant, important, and revolutionary scientists the world has ever known. She transformed the way people look at the world of energy and the resources available to us. But in doing so, she paid the ultimate price. She worked daily with radioactive materials, long before anyone knew their dangers. She took detailed notes of her observations and experiments, as a good scientist does. Little did she know, her painstaking work was slowly killing her.

An Important Scientist

Curie spent her life studying energy called *radiation*. In fact, she invented the word *radioactive* to describe this energy. Her investigations and experiments helped other scientists understand how atoms work. Curie also learned many things that became instrumental in finding new ways to treat cancer.

Discovering Radium

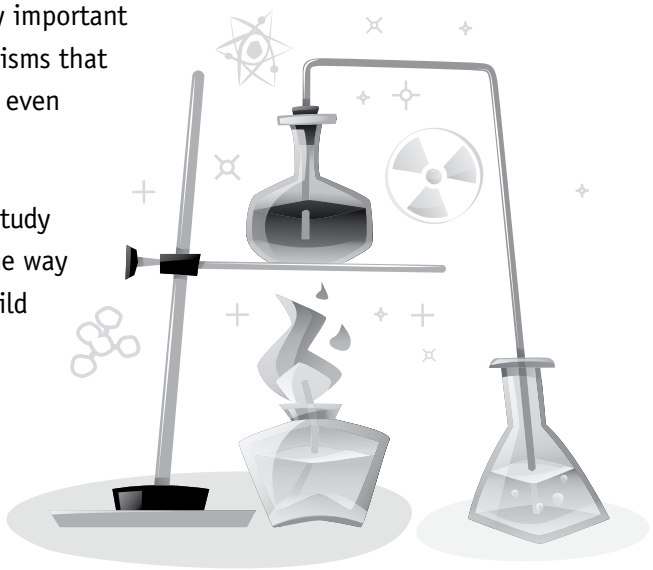
Curie suspected that the energy from uranium had to do with its atoms. Atoms are the basic building blocks that make up everything in the universe. Curie and her husband tested other elements to see if they generated radiation. This work led them to discover an element, which they named *radium*.

During this time, both scientists found themselves tired and losing weight. Their fingers were numb and burned. Perhaps they didn't realize that these symptoms were a result of handling radium. Some experts think the Curies knew radium would make them sick, but they ignored the dangers to continue their work.

The Final Years

Curie grew weaker and weaker from radiation sickness. Her eyesight was threatened, and finally, she became ill with cancer. In 1934, Curie died of the disease. The world mourned the loss of this great scientist.

But Curie had left a remarkable legacy. Her work led to many important findings, including the use of radiation to treat cancer, kill organisms that spoil food, find weaknesses in bridges, find smoke in homes, and even determine the age of dinosaur bones.



Because of Curie, there is also a new branch of science: the study of radioactivity. Her discovery of radium and its uses changed the way people think about matter and energy. Scientists continue to build on her work.

Curie was afraid her discoveries would be used to make weapons, and her fears were realized when the atomic bomb was made. But her work has also done great good in the world—and that's exactly what she hoped to do.

Name:_____ Date:_____

"Marie Curie" Response

Directions: Reread the text on page 75 to answer each question.

1. Radiation is a form of _____.

   (A) energy
   (B) science
   (C) cancer
   (D) legacy

2. How do people use radiation today?

   _____

   _____

3. How did Marie Curie pay the ultimate price?

   _____

   _____

4. How did Curie leave a remarkable legacy?

   _____

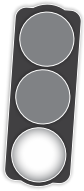
   _____

   _____

   _____

Curie discusses her scientific findings.

A Moment of Radiation

	Lesson Steps	Teacher Think Alouds
 **Ready, Set, Predict!**	• Provide students with the poem, and project a larger version for the class to see while you model. • Ask students to work in teams to read the title and predict how the poem might relate to the text about Marie Curie.	
 **Go!**	• Challenge students to read the poem independently, drawing hearts beside each part of the text that shows emotion. • Read the text aloud as students follow along. Demonstrate reading with expression to indicate the author's feelings.	"The author is grateful that Curie's work helps her mom. I can imagine she would feel emotional about this."
 **Reread to Clarify**	• Ask students to circle *–tion* words as they reread the text to clarify. In teams, have students discuss the words' meanings and why the author selected them. How do they contribute to the theme? • Invite students to meet in pairs to discuss the text and its central theme.	"Based on the author's use of the words *castigation* and *detestation*, I wonder if people agreed with Curie."
 **Reread to Question**	• Tell students to reread the text for the purpose of questioning. Ask them to underline at least two sentences and to write questions for the underlined text.	
 **Reread to Summarize and Respond**	• Have partners work together to create four to six sketches that summarize the poem.	

***Note:** For more tips, engagement strategies, and fluency options to include in this lesson, see pages 122–128.

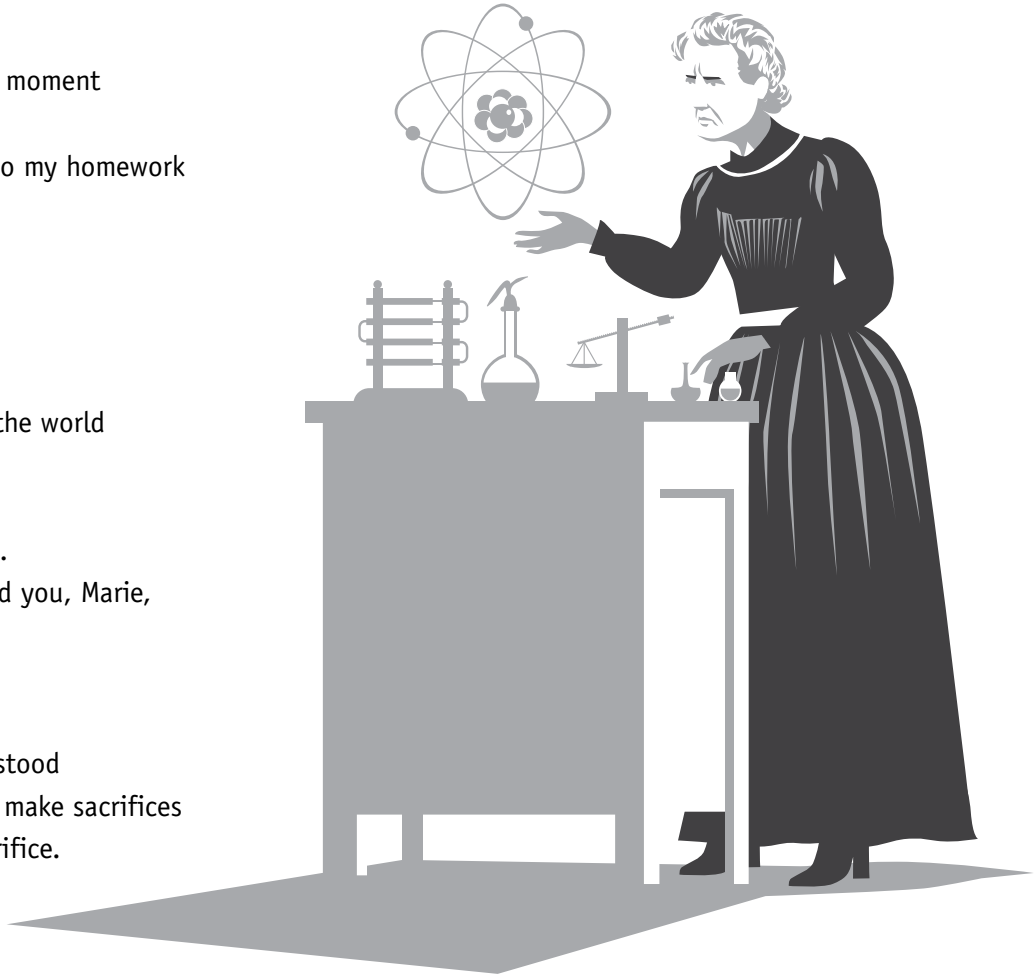
Name:_____ Date:_____

A Moment of Radiation

By Andrea Verde

I believe that it is plain to see
Upon this opinion, we can surely agree
Never before was there
or after will there ever be
A scientist as incredible as Marie Curie
What you did defies explanation
Entire life spent in radiation
At a time when working alone as a scientist
As a woman,
caused castigation
detestation
aggravation
But nevertheless, you showed determination.
I'll stop rhyming for a moment
In this moment
As I sit with my mother
Asleep, free from pain, for the moment
this moment
I have a moment to get back to my homework
Science
Radiation
You
I've been learning about you
The sacrifices you made
For science, for discovery, for the world
Right now,
in this moment
...for my mom.
The thing that eventually killed you, Marie,
has,
for the moment,
saved her life.
Radiation could only be understood
by someone willing to make sacrifices
In your case, the ultimate sacrifice.

Mom gets sick,
Well, more sick
A different sick,
From the treatments.
But she is getting better
because of radiation
because of discoveries you made
Your work as a scientist has helped so many people
But right now,
in this moment,
I only care about how
what you did
helped my mom.



Name:_____ Date: _____

"A Moment of Radiation" Response

Directions: Reread the poem on page 78 to answer each question.

1. According to the poet, what kind of sacrifice did Marie Curie make?

   (A) She had to work a lot.

   (B) She spent a lot of time studying.

   (C) Curie's work ended up killing her.

   (D) Curie cured cancer for the poet's mother.

2. Why might it have been a problem for a woman to be a scientist during Curie's lifetime?

   _____

   _____

3. The poet says that Curie's work helped so many people, but what is the poet's main concern?

   _____

   _____

   _____

Name:_____ Date:_____

Let's Compare!

Helpful and Harmful

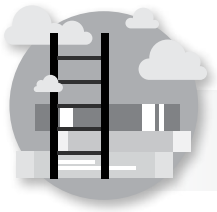
Directions: Complete the chart. Describe how radiation can be helpful and how it can be harmful. Write a paragraph that summarizes how radiation is both helpful and harmful.

Helpful	Harmful

Name:_____ Date: _____

Thinking About Radiation

Directions: Choose at least two of these activities to complete.



Expanding Reading

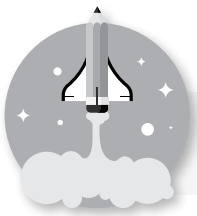
Reread "A Moment of Radiation." Then research Marie Curie. What was her background? How did she break barriers for women in science? Share your findings with a partner.

Building Fluency

Read "Marie Curie" with a partner. Take turns performing paragraphs. Focus on reading with emotion and expression.

Exploring Words

Reread "A Moment of Radiation," and write phrases that show the poet is grateful to Marie Curie.



Crafting Writing

Reread "Marie Curie." Write your own poem about Curie and her work with radiation. Use "A Moment of Radiation" as inspiration for your poem.