

### About the Book

Text Type: Nonfiction/Informational Page Count: 16 Word Count: 1,074

### Book Summary

*Curiosity on Mars* introduces readers to NASA's *Curiosity* rover and describes its two-year mission—to discover if life ever existed on the Red Planet. Sit with the crew on Earth as *Curiosity* lands on Martian soil and begins to explore. The book explains how the rover uses satellites and other equipment to look for evidence of microscopic extraterrestrial life-forms hidden beneath rocks or buried under the soil and sends the information back to scientists on Earth. Photographs and diagrams support the text.

### About the Lesson

#### Targeted Reading Strategy

- Visualize

#### Objectives

- Visualize to understand text
- Identify main idea and details
- Identify and use prepositional phrases within sentences
- Recognize and use synonyms and antonyms

#### Materials

Green text indicates resources are available on the website.

- Book—*Curiosity on Mars* (copy for each student)
- Chalkboard or dry-erase board
- Pictures of Mars and the solar system
- Extra copy of the book
- Thesauri
- Visualize, main idea and details, prepositional phrases, synonyms and antonyms worksheets
- Discussion cards



Indicates an opportunity for students to mark in the book. (All activities may be demonstrated by projecting the book on an interactive whiteboard or completed with paper and pencil if the books are reused.)

#### Vocabulary

\*Bold vocabulary words also appear in a pre-made lesson for this title on [VocabularyA-Z.com](http://VocabularyA-Z.com).

- Content words:  
 Story critical: **evidence** (n.), **extraterrestrial** (adj.), **Martian** (adj.), **microbes** (n.), **mission** (n.), **rover** (n.)  
 Enrichment: **elements** (n.), **laser** (n.), **relay** (v.), **robotic** (adj.), **satellites** (n.), **simulates** (v.)

### Before Reading

#### Build Background

- Write the word *Mars* on the board. Ask students to share what they know about the planet.
- Show students pictures of Mars and the solar system, using books, magazines, or online resources. Have students close their eyes and imagine Mars. Ask them what colors, shapes, and details they see.

## Preview the Book

### Introduce the Book

- Give students their copy of the book. Guide them to the front and back covers and read the title. Have students discuss what they see on the covers. Encourage them to offer ideas as to what type of book it is (genre, text type, and so on) and what it might be about.
- Show students the title page. Discuss the information on the page (title of book, author's name).
- Preview the table of contents on page 3. Remind students the table of contents provides an overview of the book. Ask students what they expect to read about in the book, on the basis of what they see in the table of contents. (Accept all answers that students can justify.)

### Introduce the Reading Strategy: **Visualize**

- Explain to students that engaged readers often visualize, or create pictures in their mind, while reading. Visualizing is on the basis of what a person already knows about a topic. Explain that one way to visualize is to draw a picture. Read page 4 aloud while students follow along silently.
- Model how to visualize using nonfiction text.  
*Think-aloud: Whenever I read a book, I always pause after a few pages to create a picture in my mind of the information I've read. This helps me organize the important information and understand the ideas in the book. For example, on page 4, the book begins by telling readers that something will be over in the time it takes to hard-boil an egg! When I look at the picture on that page, it looks like that something might have to do with a robot of some sort. Then the author explains that scientists are watching a spacecraft land on Mars. When I read the robotic vehicle is larger than a golf cart, I stopped for a moment and visualized the golf cart I saw last summer at the golf course. I pictured its size, then imagined a robotic machine that same size, its shiny silver parts gleaming in the sun.*
- Introduce and explain the **visualize worksheet**. Have students draw what they visualized about from page 4 on the worksheet. Invite students to share their drawings.
- As students read, encourage them to use other reading strategies in addition to the targeted strategy presented in this section.

### Introduce the Comprehension Skill: **Main idea and details**

- Write the following list of words on the board: *Saturn, Earth, Mercury, Jupiter, and Venus*. Ask students to tell what these words refer to (planets). Point out that the definitions of these words helps to identify a main idea. (There are eight different planets in our Solar System.) The words *Saturn, Earth, Mercury, Jupiter, and Venus* are the details that support this main idea.
- Model identifying the main idea and details of the first page.  
*Think-aloud: When I look at the photograph on page 4, I see one machine lowering another to the ground. I know the title of this page is "Landing on Mars," so that must be Curiosity landing on Mars. I read it is the largest robotic vehicle that NASA has ever built, and its job is to look for evidence of life on Mars. When I read on, I know I will find out even more details about Curiosity. As I read, I will pause after a few pages to review in my mind the important details. This strategy will help me make sure I understand what I'm reading. I know that effective readers do this when they read, so I am going to look for the main idea and supporting details as I read this book.*

### Introduce the Vocabulary

- Cut out the photographs from pages 8, 10, and 14 from the book. Write the following vocabulary words on the board: *extraterrestrial, mission, and rover*.

## Lesson Plan *(continued)*

## Curiosity on Mars

- Show students the photograph from page 8. Point out the caption and read it aloud. Explain this is a photograph of Mars, taken from space. Explain to students that Earth and Mars both have volcanoes, mountains, and valleys. Explain that the planets look similar, and that humans have long wondered if Mars could or has ever supported life. Explain that it is *Curiosity's* job to search for extraterrestrial life-forms hiding beneath rocks or buried under the soil. Ask volunteers to explain what they think *extraterrestrial* means. Have students turn to the glossary and read the definition for *extraterrestrial*. Find the word *extraterrestrial* on page 8 and ask a volunteer to read the sentence containing the word aloud.
- Show students the photograph from page 14. Read the information on the photograph, and explain that it shows the path *Curiosity* will take as it explores the surface of Mars. Ask where the mission starts (Bradbury Landing) and where the mission ends (Glenelg Destination). Ask students how long the path is (176 meters). Explain to students that *Curiosity's* mission will take two years to complete. Ask volunteers to explain what they think *mission* means. Have students turn to the glossary and read the definition for *mission*. Find the word *mission* on page 7 and ask a volunteer to read the sentence containing the word aloud.
- Show students the photograph from page 10. Read the information on the photograph, and explain that different cameras are needed for the mechanical rover to perform different jobs. Ask volunteers to explain what they think *rover* means. Have students turn to the glossary and read the definition for *rover*. Find the word *rover* on page 4 and ask a volunteer to read the sentence containing the word aloud.

### Set the Purpose


- Have students read to find out more about *Curiosity* and its mission. Remind them to stop after every few pages to visualize the most important information and draw on their worksheet what they visualized about it.


## During Reading


### Student Reading

- **Guide the reading:** Have students read from page 5 to the end of page 9. Encourage those who finish early to go back and reread. When students are ready, discuss the important details they identified.
- Model visualizing.  
*Think-aloud:* When I read about Curiosity's landing, I pictured a room full of people nervously watching a big screen silently. I pictured people wringing their hands, biting their nails, and crossing their fingers. Then I thought about how the mood in the room changes when Curiosity successfully lands, and pictured people cheering loudly, hugging, jumping up and down, and clapping happily.
- Have students share the pictures of what they visualized while reading. Have them explain their drawings aloud.
- Model identifying the main idea and details of the second section.  
*Think-aloud:* As I read the section titled "Searching for E.T.," I noticed most of the sentences mentioned something about looking for life on Mars. I read that proof of life has never been found on Mars. I also read that water flowed on Mars long ago and that water is vital for life. Curiosity's mission is to search for tiny extraterrestrial life-forms hiding beneath rocks or buried under the soil. On the basis of what I've read, I think the main idea of the section is: Curiosity's mission is to search for life on Mars.
- Write the main idea on the board. Ask students to identify details that support this main idea (proof of life never found, water flowed on Mars long ago, search for tiny extraterrestrial life-forms, and so on). Write the details on the board as students recall them.

- **Check for understanding:** Have students read to the end of page 12. Have them visualize the information on those pages. Discuss what they visualized. Ask students to use their worksheet to add to their drawings as they visualize the information in the book. Point out that they can use their drawings to identify the important details of the page.

 Have students reread the section titled "Mobile Science Lab," looking for the main idea and important details. Invite them to share the important details they underlined. Write these details on the board. Divide students into groups and have them work with their group to identify the main idea from the details of pages 10 through 12. Discuss their responses as a class, and write the main idea on the board.

 Have students read the remainder of the book. Remind them to visualize as they read and have them continue to put an asterisk or a star next to information where they visualized.

 Have students make a question mark in their book beside any word they do not understand or cannot pronounce. Encourage them to use the strategies they have learned to read each word and figure out its meaning.

### After Reading

- Ask students what words, if any, they marked in their book. Use this opportunity to model how they can read these words using decoding strategies and context clues.

### Reflect on the Reading Strategy

- Ask students to explain or show how the strategy of visualizing helped them understand and remember important events in the story.
- **Think-aloud:** *When I read about Gale Crater, I pictured a meteor crashing forcefully into the red surface of Mars. I pictured the surface giving way as the meteor sunk lower and lower into the planet. This helped me to remember what Gale Crater looks like and to remember that part of the book.*
- **Independent practice:** Have students complete the visualize worksheet. If time allows, have students share their pictures when finished.

### Reflect on the Comprehension Skill

- **Discussion:** Talk about how stopping to review the important details helped students remember the facts and better understand the information. Ask them to use the important details they identified to confirm or refine the main idea of the section titled "Driving Curiosity."
- Invite students to share the important details they underlined on pages 13 and 14. Write these details on the board. Divide students into small groups. Have each group work together to identify the main idea from the details and write this information on a separate piece of paper. Discuss their responses as a class.
- Discuss the main idea and supporting details of the book as a whole. Write these on the board.
- **Independent practice:** Introduce, explain, and have students complete the [main-idea-and-details worksheet](#). When students are finished, discuss answers aloud.
- **Enduring understanding:** In this book, you learned about a special mission to Mars that NASA is conducting. Now that you know this information, do you think it is important to study other planets in our Solar System? Why or why not?

### Build Skills

#### Grammar and Mechanics: Prepositional phrases

- Explain that prepositions are words that show a relationship between things. They provide information about *where*, *when*, *how*, *why*, and *with what* something happens. For example, in the sentence *I'll do my homework after lunch*, the word *after* is a preposition that provides information about when something happens. The prepositional phrase is *after lunch*.

- Explain that a *phrase* is a *short group of words*, and that a *prepositional phrase* is the *group of words beginning with a preposition and ending with a noun or pronoun*. A list of common prepositions are: *aboard, about, above, across, after, against, along, among, around, at, before, behind, below, beneath, beside, besides, between, beyond, but, by, down, during, except, for, from, in, inside, into, like, near, of, off, on, out, over, past, since, through, throughout, to, toward, under, underneath, until, up, upon, with, within, and without*. Write these on a poster to hang in the classroom with the title *Prepositions*.
- Read the following sentence from page 6 aloud: *About 66 feet (20 m) above the planet's surface, the Sky Crane gently lowers Curiosity to the ground on cables*. Point to the word *above*. Have a volunteer explain how this preposition is used in the sentence (it explains *where* the Sky Crane is). Ask a student to come up to the board to circle the prepositional phrase (*above the planet's surface*). Point to the word *to*. Have a volunteer explain how this preposition is used in the sentence (it explains *where* Curiosity is lowered). Ask a student to come up to the board to circle the prepositional phrase (*to the ground*).



**Check for understanding:** Have students turn to page 5 and underline examples of prepositional phrases. On the board, write the prepositional phrases students identify in the book. Discuss the type of information each prepositional phrase provides (how, when, why, and so on) and how each one links the words in the sentence.

- **Independent practice:** Introduce, explain, and have students complete the [prepositional phrases worksheet](#). When students are finished, discuss answers aloud.

### Word Work: **Synonyms and antonyms**

- Write the word *beautiful* on the board. Ask students to suggest a word that means almost the same thing (*pretty, lovely*). Review or explain that a word that means the same or almost the same as another word is called a *synonym*. Ask students to suggest a word that means the opposite of *beautiful* (*ugly, hideous*). Review or explain that a word that means the opposite of another word is called an *antonym*.
- Have students turn to page 6 and reread the last paragraph. Write the following sentence on the board: *A few cry*. Circle the word *cry*. Ask them to suggest a word that means the same or almost the same as *cry* (*weep, shed tears*). Ask students to suggest a word that means the opposite of *cry* (*laugh*).
- Show students a thesaurus. Use the example above to explain how a thesaurus is used, writing the synonyms and antonyms for *cry* on the board.
- **Check for understanding:** Give pairs of students a thesaurus. Ask them to find the word *small* and have them name the synonyms listed. If the thesaurus lists antonyms, have them find the antonyms for *small*. If needed, provide additional practice using a thesaurus.
- **Independent practice:** Introduce, explain, and have students complete the [synonyms-and-antonyms worksheet](#). When students are finished, discuss answers aloud.

## Build Fluency

### Independent Reading

- Allow students to read their book independently. Additionally, partners can take turns reading parts of the book to each other.

### Home Connection

- Give students their book to take home to read with parents, caregivers, siblings, or friends. Have them visualize with someone at home when they read the book.

## Extend the Reading

### Informational Writing Connection

Brainstorm with students to create a list of planets, and write them on the board. Have each student choose a planet (besides Mars or Earth) to learn more about. Provide print and Internet resources, and help them research to find out more about their chosen planet. Write the following questions on the board for students to use as guides: *Where is the planet located in relation to the other planets? What does it look like? How hot or cold is it? What are its defining characteristics?* Have students write a report on the planet. Require an error-free final draft with a title page and illustration.

Visit [WritingA-Z.com](http://WritingA-Z.com) for a lesson and leveled materials on informational writing.

### Social Studies and Science Connection

Discuss the fact that throughout history, people have been curious about Mars and other planets. Point out that NASA has helped answer a lot of questions people have long had and continues to answer even more questions as time goes on. Discuss NASA's main objectives and accomplishments throughout history, and have students talk about what they think NASA should do in the future.

### Skill Review

**Discussion cards** covering comprehension skills and strategies not explicitly taught with the book are provided as an extension activity. The following is a list of some ways these cards can be used with students:

- Use as discussion starters for literature circles.
- Have students choose one or more cards and write a response, either as an essay or as a journal entry.
- Distribute before reading the book and have students use one of the questions as a purpose for reading.
- Cut apart and use the cards as game cards with a board game.
- Conduct a class discussion as a review before the book quiz.

## Assessment

### Monitor students to determine if they can:

- consistently use the strategy of visualizing to comprehend the text during discussion and on a worksheet
- accurately identify the main idea and supporting details to better understand the text in discussion and on a worksheet
- correctly identify and use prepositional phrases during discussion and on a worksheet
- correctly identify, select, and use synonyms and antonyms during discussion and on a worksheet

### Comprehension Checks

- **Book Quiz**
- **Retelling Rubric**