**LESSON 2 TEACHER’S GUIDE**

**Dust from Comets**

by Helen Webber

Fountas-Pinnell Level U

Informational Text

**Selection Summary**

Scientists sent the spacecraft *Stardust* into space to collect data from Comet Wild 2. The spacecraft took photographs and collected comet dust. Scientists use dust samples to learn about comets, the solar system, and the beginnings of life.

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**Characteristics of the Text**

<table>
<thead>
<tr>
<th>Genre</th>
<th>Informational text</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Text Structure</strong></td>
<td>Third-person narrative</td>
</tr>
<tr>
<td></td>
<td>Chronological description of <em>Stardust</em> mission</td>
</tr>
<tr>
<td><strong>Content</strong></td>
<td>Solar system bodies other than planets, such as comets</td>
</tr>
<tr>
<td></td>
<td>Goals, methods, and findings of the <em>Stardust</em> space mission</td>
</tr>
<tr>
<td></td>
<td>Analysis of data learned from comet dust</td>
</tr>
<tr>
<td><strong>Themes and Ideas</strong></td>
<td>Curiosity about space, solar system</td>
</tr>
<tr>
<td></td>
<td>Effects of science and technology on space exploration</td>
</tr>
<tr>
<td></td>
<td>Influence of data analysis on current space theories</td>
</tr>
<tr>
<td><strong>Language and Literary Features</strong></td>
<td>Language descriptive of space exploration</td>
</tr>
<tr>
<td></td>
<td>Conversational language</td>
</tr>
<tr>
<td><strong>Sentence Complexity</strong></td>
<td>A mix of short and complex sentences</td>
</tr>
<tr>
<td></td>
<td>Italic for terms, name of spacecraft</td>
</tr>
<tr>
<td><strong>Vocabulary</strong></td>
<td>Many technical terms, some of which might not be familiar to English language learners, such as <em>asteroid</em>, <em>coma</em>, <em>comet</em>, <em>meteoroid</em>, <em>aerogel</em>, <em>periscope</em>. Cultural references such as <em>NASA</em> (p. 3).</td>
</tr>
<tr>
<td><strong>Words</strong></td>
<td>Multisyllable words such as <em>astronomers</em>, <em>asteroids</em>, <em>experiments</em></td>
</tr>
<tr>
<td><strong>Illustrations</strong></td>
<td>Illustrations and photographs support the text and add interest</td>
</tr>
<tr>
<td></td>
<td>Captions in text boxes explain details of illustrations and photographs</td>
</tr>
<tr>
<td><strong>Book and Print Features</strong></td>
<td>Sixteen pages of text, plus a table of contents</td>
</tr>
<tr>
<td></td>
<td>Easy-to-read chapter headings and run-in subheadings</td>
</tr>
</tbody>
</table>

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Dust from Comets by Helen Webber

Build Background
Help students use their knowledge about our solar system to visualize the selection. Build interest by asking a question such as the following: Have you ever seen a star moving through the sky? Read the title and author and discuss the cover illustration. Tell students that informational text will provide facts and details about the Stardust mission.

Frontload Vocabulary
Some everyday words may be unfamiliar to English learners. Before reading, check understanding of the following words: dust, clue, sky, star, sun, Earth, rock, planet, life.

Introduce the Text
Guide students through the text, reading the captions, noting important ideas and helping with unfamiliar language and vocabulary so they can read the text successfully. Call their attention to any important labels. Here are some suggestions:

Page 3: Explain that this is an article about a space mission. Suggested language: This is the introduction to the article. The chapter heading means that the space mission involves a “meeting” with a comet. Read the caption and look at the illustration of the Stardust. Cultural Support: Give background about NASA.

Page 8: Discuss the Stardust spacecraft’s mission. Read the first sentence: The Stardust project’s mission was to bring comet dust back to Earth. Ask: What do you think scientists can learn from comet dust?

Page 9: Read the caption. Tell students that the Stardust took 72 photos of the comet with an acute, or extremely sharp, camera system. Ask: How would an acute camera system provide scientists with clues about comets?

Page 13: Point out the photograph of Comet Wild 2 and read the captions aloud. The Stardust collected dust from the comet named Comet Wild 2. Look at the photograph of the comet. Ask: How would you describe Comet Wild 2? Turn back to the beginning and read to find out how scientists collected and studied comet dust and what they learned from it.

Target Vocabulary

- **acute** – extremely sharp or keen, p. 9
- **adjusted** – have changed and improved something, p. 12
- **axis** – a real or an imaginary straight line that goes through the center of a spinning object, p. 12
- **delicate** – fragile, p. 4
- **flawed** – having mistakes, p. 15
- **function** – work or operate, p. 10
- **operator** – someone whose job is to use or control a machine or vehicle, p. 12
- **simulate** – to imitate something in a way that is very close to the real thing, p. 11
- **tethered** – tied to something, p. 14
- **version** – a form of something that varies from other forms of the same thing, p. 16
Read
Have students read silently while you listen to individual students read aloud. Support their understanding of the text as needed.

Remind students to use the Question Strategy as they read. Tell them to think about questions scientists had about comets when they designed this mission.

Discuss and Revisit the Text

Personal Response
Invite students to share their personal responses to the text.

Suggested language: What do you think is most interesting for the scientists who study comet dust?

Ways of Thinking
As you discuss the text, help students understand these points:

<table>
<thead>
<tr>
<th>Thinking Within the Text</th>
<th>Thinking Beyond the Text</th>
<th>Thinking About the Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Comets are small bodies, made of rock, ice, and minerals, that exist in our solar system.</td>
<td>• Bodies in space have intrigued people all over the world for centuries.</td>
<td>• Chapter headings, and section subheadings give clues about the content to follow.</td>
</tr>
<tr>
<td>• The Stardust space mission took photographs and collected dust from Comet Wild 2.</td>
<td>• Advances in technology will make it easier for scientists to collect space materials and study the materials.</td>
<td>• Illustrations with captions in text boxes further explain the text.</td>
</tr>
<tr>
<td>• Scientists hope to learn more about comets, and our solar system by studying comet dust.</td>
<td>• By studying real data, such as space dust, scientists come up with more questions and new ways of thinking about the solar system.</td>
<td>• The glossary at the end of the article lists and defines technical and other unfamiliar words from the text.</td>
</tr>
</tbody>
</table>

Choices for Further Support

• Fluency Invite students to participate in choral reading. Remind them to use punctuation, including dashes, as well as sentence structure and content, as a guide for when to pause.

• Comprehension Based on your observations of the students’ reading and discussion, revisit parts of the text to clarify or extend comprehension. Remind students to go back to the text to support their ideas.

• Phonics/Word Work Provide practice as needed with words and word parts, using examples from the text. Have students define the word astronomer based on its use on pages 4 and 5. Point out the Greek root astro-, meaning “star.” Ask students to name other words that share a root with astronomer (astronomy, astronaut).
Writing about Reading

Critical Thinking
Have students complete the Critical Thinking questions on BLM 2.10.

Responding
Have students complete the activities at the back of the book, using their Reader’s Notebook. Use the instruction below as needed to reinforce or extend understanding of the comprehension skill.

Target Comprehension Skill
Text and Graphic Features Remind students that they can examine the illustrations and captions to help them better understand the text in the selection. Model how to add details to the Graphic Organizer, using a “Think Aloud” like the one below:

Think Aloud
The caption for the photograph on page 4 tells how the planets revolve around the sun. The caption for the illustration on page 7 shows where the Asteroid and Kuiper Belts are located. Both are graphic features that aid understanding.

Practice the Skill
Have students share their examples of other articles in which text and graphic features support the facts and details contained in the selection.

Writing Prompt: Thinking Beyond the Text
Have students write a response to the prompt on page 6. Remind them that when they think beyond the text, they use their personal knowledge to reach new understandings.

Assessment Prompts
• What is this article mainly about?
• How does the author organize the information in this article?
• Which sentences on pages 4 and 5 support the idea that people have been interested in comets for a long time?
Critical Thinking

Read and answer the questions. Possible responses shown.

1. Think within the text
   What did Edmund Halley discover?

2. Think within the text
   How are meteoroids and comets the same?

3. Think beyond the text
   Based on the author’s description of comets, why do you think people long ago thought they looked like other things?

4. Think about the text
   Why do you think the author used a picture that does not show the Oort Cloud on page 7?

Making Connections

Each comet has a different name. Imagine you discovered a comet. What would you name it and why?

Write your answer in your Reader’s Notebook.

English Language Development

Reading Support Pair English-speaking and English language learners so that they can check their understanding with each other.

Vocabulary The selection contains the acronym NASA (page 3). Explain to students that NASA is an acronym, a word formed from the initials of several words. Tell students that NASA stands for National Aeronautics and Space Administration.

Oral Language Development

Check student comprehension, using a dialogue that best matches your students’ English proficiency. Speaker 1 is the teacher; Speaker 2 is the student.

<table>
<thead>
<tr>
<th>Beginning/Early Intermediate</th>
<th>Intermediate</th>
<th>Early Advanced/Advanced</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speaker 1: What is the Stardust?</td>
<td>Speaker 1: What was the job of the Sample Return Capsule?</td>
<td>Speaker 1: How did scientists learn about Comet Wild 2?</td>
</tr>
<tr>
<td>Speaker 2: a spacecraft</td>
<td>Speaker 2: It collected comet dust and carried the dust back to Earth.</td>
<td>Speaker 2: They sent a spacecraft, the Stardust, out to the comet. The spacecraft took photographs and collected comet dust. Then it carried the dust back to Earth for scientists to study.</td>
</tr>
<tr>
<td>Speaker 1: What did the Stardust collect?</td>
<td>Speaker 1: How is Comet Wild 2 different from other comets?</td>
<td></td>
</tr>
<tr>
<td>Speaker 2: comet dust</td>
<td>Speaker 2: The surface of Comet Wild 2 is pocked, not smooth like other comets.</td>
<td></td>
</tr>
<tr>
<td>Speaker 1: Where did Stardust get the comet dust?</td>
<td>Speaker 2: What was the job of the Sample Return Capsule?</td>
<td></td>
</tr>
<tr>
<td>Speaker 2: Comet Wild 2</td>
<td>Speaker 2: It collected comet dust and carried the dust back to Earth.</td>
<td></td>
</tr>
</tbody>
</table>

Responding

Text and Graphic Features

Which text feature shows how the planets rotate around the sun? What other purposes does this text feature have? Copy and complete the chart shown below. Then add one other text feature and its purpose.

<table>
<thead>
<tr>
<th>Text Feature</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>To show how the planets rotate around the sun?</td>
</tr>
</tbody>
</table>

Write About It

The Stardust spacecraft traveled into space to collect, store, and study samples of comet dust. Write a paragraph or two telling the story of another example of space exploration that you have heard about.
Dust from Comets

Thinking Beyond the Text

Think about the questions below. Then write your answer in one or two paragraphs.

Remember that when you think beyond the text, you use your personal knowledge to reach new understandings.

What are the benefits of the Stardust mission and other space missions? Do you think these benefits are worth the money that is spent on the space missions? Why or why not? Explain your answer, giving examples from the selection.

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Critical Thinking

Read and answer the questions.

1. **Think within the text**  What did Edmund Halley discover?

2. **Think within the text**  How are meteoroids and comets the same?

3. **Think beyond the text**  Based on the author’s description of comets, why do you think people long ago thought they looked like other things?

4. **Think about the text**  Why do you think the author used a picture that does not show the Oort Cloud on page 7?

**Making Connections**  Each comet has a different name. Imagine you just discovered a comet and created a name for it. Why would you choose that name?

**Write your answer in your Reader’s Notebook.**
# Dust from Comets • LEVEL U

<table>
<thead>
<tr>
<th>Page</th>
<th>Selection Text</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>A Sample Return Capsule was attached to the spacecraft. This capsule collected samples of comet particles and dust. The capsule analyzed and stored the samples. Then the whole spacecraft went back to Earth. When the spacecraft got near Earth, the capsule detached from the spacecraft. The capsule used a parachute to return to Earth with the samples of comet dust.</td>
</tr>
<tr>
<td>11</td>
<td>Inside the Sample Return Capsule was a special device. The device was shaped like a tennis racket. The device held many thin blocks of aerogel, a strong, lightweight material. The device folded out of the capsule to collect comet dust.</td>
</tr>
</tbody>
</table>

**Comments:**

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Code</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read word correctly</td>
<td>cat</td>
<td>0</td>
</tr>
<tr>
<td>Repeated word, sentence, or phrase</td>
<td>cat</td>
<td>0</td>
</tr>
<tr>
<td>Omission</td>
<td>cat</td>
<td>1</td>
</tr>
</tbody>
</table>

**Accuracy Rate**

\[
\text{Accuracy Rate} = \left( \frac{\# \text{ words read correctly}}{100} \right) \times 100 \%
\]

**Total Self-Corrections**

- Substitution: cut cat 1
- Self-corrects: cut cat 0
- Insertion: the cat 1
- Word told: cat 1

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**Grade 5**

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