



**Informational**

# Clarify Words in Science

*Odyssey magazine: On Ice*

This project was developed at the Success for All Foundation under the direction of Robert E. Slavin and Nancy A. Madden to utilize the power of cooperative learning, frequent assessment and feedback, and schoolwide collaboration proven in decades of research to increase student learning.

# ***The Reading Edge Middle Grades 2nd Edition Teacher Edition***

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## **Produced by the Reading Edge Middle Grades 2nd Edition Team**

President:	Nancy Madden
Director of Development:	Kate Conway
Rollout Committee:	Kate Conway (Chair), Mia Blom, Wendy Fitchett, Kim Gannon, Claire Krotiuk, Kristal Mallonee-Klier, Terri Morrison, Sheri Mutreja, Kenly Novotny, Peg Weigel
Program Developers:	Wendy Fitchett (Chair), Kate Conway, Victoria Crenson, Ceil Daniels, Terri Morrison
Field Advisory Team:	Kim Gannon (Chair), Jo Duplantis, Kathy McLaughlin
Contributing Developers:	Kathleen Collins, Sarah Eitel, Richard Gifford, Samantha Gussow, Patricia Johnson, Austin Jones, Susan Magri, Kim Sargeant, Becca Slavin
Designers:	Michael Hummel, Austin Jones, Vic Matusak, Susan Perkins, Christian Strama
Illustrators:	Michael Hummel, Susan Perkins
Video Producers:	Jane Strausbaugh (Senior Producer), Angie Hale, Tonia Hawkins
Editors:	Janet Wisner (Supervising Editor), Marti Gastineau, Pam Gray, Jodie Littleton
Publications Coordinator:	Sheri Mutreja
Proofreaders:	Meghan Fay, Susanne Viscarra, Janet Wisner, Michelle Zahler
Production Artists:	Irene Baranyk, Kathy Brune, Wanda Jackson, Cathy Lawrence, Irina Mukhutdinova, Michele Patterson, Karen Poe, Laurie Warner, Tina Widzbor
Online Tools Developers:	Terri Morrison (Chair), Sean Christian, Patrick Coady, Mary Conway Vaughan, Tim D'Adamo, Debi Hammel, Dia Hopp, Mike Knauer, Kristal Mallonee-Klier, Vic Matusak, Christian Strama, Melissa Stroup

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*A Nonprofit Education Reform Organization*

200 W. Towson Blvd., Baltimore, MD 21204

PHONE: (800) 548-4998; FAX: (410) 324-4444

E-MAIL: [sfainfo@successforall.org](mailto:sfainfo@successforall.org)

WEBSITE: [www.successforall.org](http://www.successforall.org)

# Clarify Words in Science

**Odyssey**  
magazine: *On Ice*

## The Lightning Round

- Random Reporters share team responses; team reps from other teams may agree, disagree, or add on to these responses.
- Use the following rubrics to evaluate responses and give specific feedback.
- Award points to the teams with 100-pt. responses; add the points to the Team Celebration Points poster.
- Celebrate team successes.

<b>Strategy Use</b>	
The Random Reporter:	
<b>100</b>	gives a 90-pt. response <b>and explains how using the strategy helped in better understanding the text.</b>
<b>90</b>	gives an 80-pt. response <b>and describes a problem and a strategy that was used to solve the problem.</b>
<b>80</b>	<b>identifies a problem that a team member had understanding the text.</b>

<b>Word Power</b>	
The Random Reporter:	
<b>100</b>	gives a 90-pt. response <b>and expands on the meaning, for example, identifies</b> <ul style="list-style-type: none"> <li>• related words</li> <li>• a second meaning</li> <li>• a word connotation</li> <li>• an antonym</li> </ul>
<b>90</b>	gives an 80-pt. response <b>and explains the meaning in a definition and a meaningful sentence.</b>
<b>80</b>	<b>tells a word or phrase added to the word power journal and why it was added (what makes it important or interesting).</b>

<b>Summary</b>	
The Random Reporter:	
<b>100</b>	gives a 90-pt. response <b>and uses key vocabulary correctly.</b>
<b>90</b>	gives an 80-pt. response <b>and clearly connects relevant ideas in a logical order.</b>
<b>80</b>	<b>presents main ideas and important details in his or her own words and without personal opinion.</b>

<b>Team Talk (oral and written)</b>	
The Random Reporter:	
<b>100</b>	gives a 90-pt. response <b>and connects the answer to the supporting evidence and uses academic language.</b>
<b>90</b>	gives an 80-pt. response <b>and includes supporting evidence and examples (from the text or from experience).</b>
<b>80</b>	<b>uses full sentences to clearly and correctly answer the question.</b>

<b>Fluency</b>	
The Random Reporter:	
<b>100</b>	gives a 90-pt. response <b>and reads smoothly and with expression (shows emotion and changes with punctuation and dialogue).</b>
<b>90</b>	gives an 80-pt. response <b>and reads at just the right pace to understand the text—not too slow and not too fast.</b>
<b>80</b>	<b>reads a short passage and pronounces most of the words correctly.</b>

<b>Graphic Organizer/Notes</b>	
The Random Reporter:	
<b>100</b>	gives a 90-pt. response <b>and explains how the graphic organizer helped in understanding the text.</b>
<b>90</b>	gives an 80-pt. response <b>and includes main points or events and important details.</b>
<b>80</b>	<b>selects a graphic organizer that is appropriate for the text.</b>

**P**

## Unit Objectives

**Reading:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

**Writing:** Use key scientific terms and definitions from the text to explain a process.

## Unit Overview

The focus of this unit is on clarifying words in scientific text. Students will clarify the meanings of words that are used in the magazine articles for this unit. Although the focus in this unit is clarifying words through the use of a scientific text, this skill can also be applied to other subjects, such as English and social studies. In this unit, clarifying words will help students ensure that they understand the scientific subject matter of the articles they read. Throughout both cycles, strategies that will be used to clarify words include rereading, using background or prior knowledge, looking at text features such as pictures and diagrams, and looking for familiar word parts within an unfamiliar word.

As students preview articles and prepare to read, encourage them to use text features to make predictions about the topic and ideas presented in them.

Predicting what information an author is going to present and how it is organized will help students start thinking about the ideas in the article, help them set up their notes, and improve their comprehension of the text.

### Predicting

#### Informational Text

1. Before you read, ask:  
What clues can help me predict what this text is about?
  - titles
  - headings
  - bold text
  - captions
  - sidebars
  - pictures
2. Use clues to predict the topic of the text. Be prepared to explain your thinking.
3. Can you confirm your prediction?

#### Literature

1. As you read, ask: What clues can help me predict what might happen?
  - setting
  - events
  - character's actions, thoughts, feelings
  - dialogue
2. Use clues to predict possible outcomes. Be prepared to explain your thinking.
3. Read on to find out if your prediction is confirmed.

You will be referring students to the Predicting Strategy card in their team folders. The Predicting Strategy card is a tool that prompts your students to look for clues to predict what the text is about. Encourage students to use the Predicting Strategy card throughout this unit and throughout the year to help them make predictions and identify clues, recognize information that confirms their predictions, and improve their comprehension of the text.

The writing objective is to use scientific terms and definitions to explain a process. Students will have a chance to practice this in lesson 5 of both cycles. The writing prompts require them to use the scientific terms that they learn through their reading to successfully describe different processes.

### Unit Topic/Content

The text for this unit is the *Odyssey* magazine issue *On Ice*. Students will read several articles throughout both cycles. They will learn about snowflakes, glaciers, icebergs, the importance of ice in medicine, the way that frost can negatively impact crops such as cranberries, and the destruction that ice can cause. Students will have a chance to make connections between the articles through the writing project in both cycles. Although the articles focus on different topics related to ice, there are some common ideas; for example, ice is powerful and ice can have a huge impact.

## Text and Media Selections

### Internet/Media Options

To expand your students' background knowledge, consider using Internet/media options with lessons. Always preview sites for availability and suitability. Please make sure you have the correct plug-ins.

## At a Glance

Cycle 1		
Lesson	Text	Media
Lesson 1	"Seeing Snow," pages 11–13	(Optional) background website: "Snowflake Physics" This website shows how snowflakes form and how their growth may be affected. <a href="http://www.pbslearningmedia.org/content/lsp07.sci.phys.matter.snowflakes">www.pbslearningmedia.org/content/lsp07.sci.phys.matter.snowflakes</a>
Lesson 2	"Seeing Snow," pages 14–16	(Embedded) "Team Talk Response"
Lesson 3	"Attack of the Real Snow Monster," pages 17–19	(Embedded) background video: "Science Nation: Ice Core Lab"
Lesson 4	"Make an Iceberg...Save a Glacier—All With Ice Cubes," pages 24 and 25	

**Odyssey  
magazine:  
On Ice**

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magazine:  
On Ice**

<b>Lesson 5</b>	writing in response to reading	
<b>Lesson 6</b>	"The Ice Storm That Stole Christmas" and "Ice Power—It Can Break Steel!" pages 26–29	
<b>Lesson 7</b>	self-selected reading	
<b>Lesson 8</b>	Getting Along Together	

Cycle 2		
Lesson	Text	Media
<b>Lesson 1</b>	"This is Your Brain on Ice," pages 37–39	
<b>Lesson 2</b>	"Asteroid Special Delivery," "It's an Icequake," and "Moons Born from Speeding Ice," pages 4 and 5	
<b>Lesson 3</b>	"The Truth About Ice-Nine," pages 6–8	
<b>Lesson 4</b>	"The Truth About Ice-Nine," pages 8 and 9	
<b>Lesson 5</b>	writing in response to reading	
<b>Lesson 6</b>	"Ice Blankets," pages 34–36	
<b>Lesson 7</b>	self-selected reading	
<b>Lesson 8</b>	Getting Along Together	

## Cycle 1:

Clarify  
Words in  
Science

## Lesson 1

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

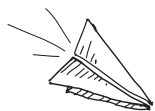
**Teacher Background**

Today students will read the article “Seeing Snow.” This article describes Dr. Ken Libbrecht’s snowflake research and provides information about how snowflakes form and the different appearances that snowflakes may have. Text features such as pictures and captions enhance the article and provide images for some of what is described in the article.

The following website provides some background information and helpful visuals that will generate interest in the article read for today’s lesson.

[www.pbslearningmedia.org/content/lsp07.sci.phys.matter.snowflakes](http://www.pbslearningmedia.org/content/lsp07.sci.phys.matter.snowflakes)

This cycle’s Big Question asks if our planet would be the same without ice. This question will get students thinking about ice, the topic of the majority of articles they will read this cycle. Hearing students’ answers will help you identify students’ prior knowledge about ice and their understanding about ice. Some students may realize the huge impact that ice has on the planet, while others may not have this prior knowledge.

**Active Instruction** 

(22 minutes)

**Big Question**

Post and present this cycle’s Big Question. Have students write a response to the question as they arrive for class.

**The Big Question:**

Would our planet be the same without ice? Why or why not?

**Set the Stage**

1. Refer students to today’s Big Question. Use **Think-Pair-Share** to ask:

**Would our planet be the same without ice? Why or why not?**

*(Answers may vary.) No, our planet would not be the same without ice. Without ice, water levels would rise. Then there could be flooding. Flooding would have a big effect on the population. It would destroy people’s homes and other buildings. Ice affects climate and is very important.*

Students write responses to the Big Question.

Discuss the Big Question.



Teams review their cycle goal.

Post and present the reading objective.

Students identify the strategies that they use to prepare to read informational text.



Build background about the topic.



2. Ask students to review their cycle goal. Remind students how to earn team celebration points. Remind them that team celebration points help them become super teams. Tell them they earn team celebration points during the Lightning Round.
3. Introduce the texts, authors, and reading objective.
4. Have teams discuss the strategies that they use when they first pick up a text. Use **Random Reporter** to share team responses.

*For example, I scan the text to see if it is informational or literature; look for clues to predict the topic and the author's intent; figure out how the text is set up so I can choose a graphic organizer for notes.*

Refer students to the Predicting Strategy card for informational text in their team folders. Review the card. Have students predict the topic and intent of the author and explain their thinking.

- T:** Snowflakes. I see pictures of snowflakes and the word *snowflake* many times.
- I:** To inform readers about snowflakes. The question in large print under the title asks "Have you ever looked closely at snow?" In the article, the author probably talks about what you see when you look at snow.
- G:** It doesn't seem like there's a sequence, so I wouldn't use a sequence chain. It seems like there will be a lot of information about snowflakes, so I would use a web.

5. (Optional) Use media to generate interest about the topic of today's reading.

**The Big Question asked about ice, and we know that snow and ice are related. Let's visit a website that will expand our background knowledge of snowflakes. This will help us as we read today.**

Visit "Snowflake Physics" at [www.pbslearningmedia.org/content/lsp07.sci.phys.matter.snowflakes](http://www.pbslearningmedia.org/content/lsp07.sci.phys.matter.snowflakes). Click on "Snowflake Basics." Read aloud, or have a student read, the description of a snow crystal and how it differs from a snowflake. Have students observe the snowflake pictured on the site. Use **Think-Pair-Share** to ask:

**Does the picture of the snowflake look the same as or different from the pictures in the magazine?**

*The snowflake looks very similar to the pictures I saw when I flipped through the magazine. The size and shape are about the same.*

Click on "Watch a Snowflake Grow." Show students the clip of Snowflake 1 growing and then the clip of Snowflake 2 growing. Use **Think-Pair-Share** to ask:

**Did they grow in the same way?**

*Snowflake 1 and Snowflake 2 seemed to grow in the same way. They both grew very quickly. However, it looked like all the sides of Snowflake 2 were growing at about the same time. It looked like the sides of Snowflake 1 were not all growing at the same time.*

## Interactive Read Aloud

**This cycle our reading objective is using strategies to clarify the meaning of key terms, words, and phrases used in scientific text. Since we will read science-related articles, it will be especially important that we clarify words we aren't familiar with. Remember that there are a lot of ways to clarify unfamiliar words. We can reread confusing text, use background knowledge, look at text features, and see if we can break words down into familiar parts. If one strategy doesn't work, we can try another.**

**Teacher:** Read aloud and think aloud to model the target skill or strategy use within the TIGRRS process.

**Students:** Actively listen.

1. Read pages 11 and 12 (stopping at paragraph 3 of “A Crystalline Echo”) aloud. A sample Think Aloud follows.

### Sample Think Aloud

I know that the objective is to clarify words that are used to describe a process. The beginning of the article didn't tell me about a process; it just described why Libbrecht is researching snowflakes. But “A Crystalline Echo” explained how snowflakes get their shape. This section used some words that I want to clarify. It says that snowflakes have the same shape as the water molecules inside of them. What are molecules? Let me think for a minute. I've read about molecules before. I think it's sort of like the smallest part of something. So, the smallest part of a snowflake affects its shape.

The molecules in snowflakes are made of two hydrogen atoms and an oxygen atom. This is H<sub>2</sub>O. The way these atoms bond makes snowflakes look like hexagons. I need to clarify this. I think atoms are also the smallest part of something, but they're different from molecules. The bond, or relationship, between atoms is why snowflakes have a certain shape.

Clarifying some of these words in the article helped me understand how snowflakes get their shape. I used background knowledge that I had about scientific words to help me understand this article.

**Teacher:** Restate important ideas in the text, and add notes to the graphic organizer.



2. Use **Think-Pair-Share** to ask:

#### **How did I use the skill?**

*You used the skill of clarifying words by thinking about what you read and thinking about words you didn't understand. You had to remind yourself what a molecule is and what an atom is based on your prior knowledge. Then you could better understand the process for a snowflake getting its shape.*

#### **How was the skill helpful?**

*The skill was helpful because it helped you understand what you read. If you hadn't clarified certain words, what you read wouldn't have made much sense.*

3. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read the last two paragraphs of “A Crystalline Echo” and the “Frosted Window Panes” text box. Use **Think-Pair-Share** to ask:

**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.

**Did you clarify any words as you read? What were the words, and what did it help you understand?**

*(Answers may vary.) I clarified the word crystallize. The text says frost happens when water molecules crystallize from water vapor. I didn't know this word, so I used context clues and prior knowledge. I know what frost looks like—like crystals. The water looks like crystals, so I think crystallize means to make crystals. Since the molecules are crystallizing from water vapor, it makes sense that they are forming into crystals.*



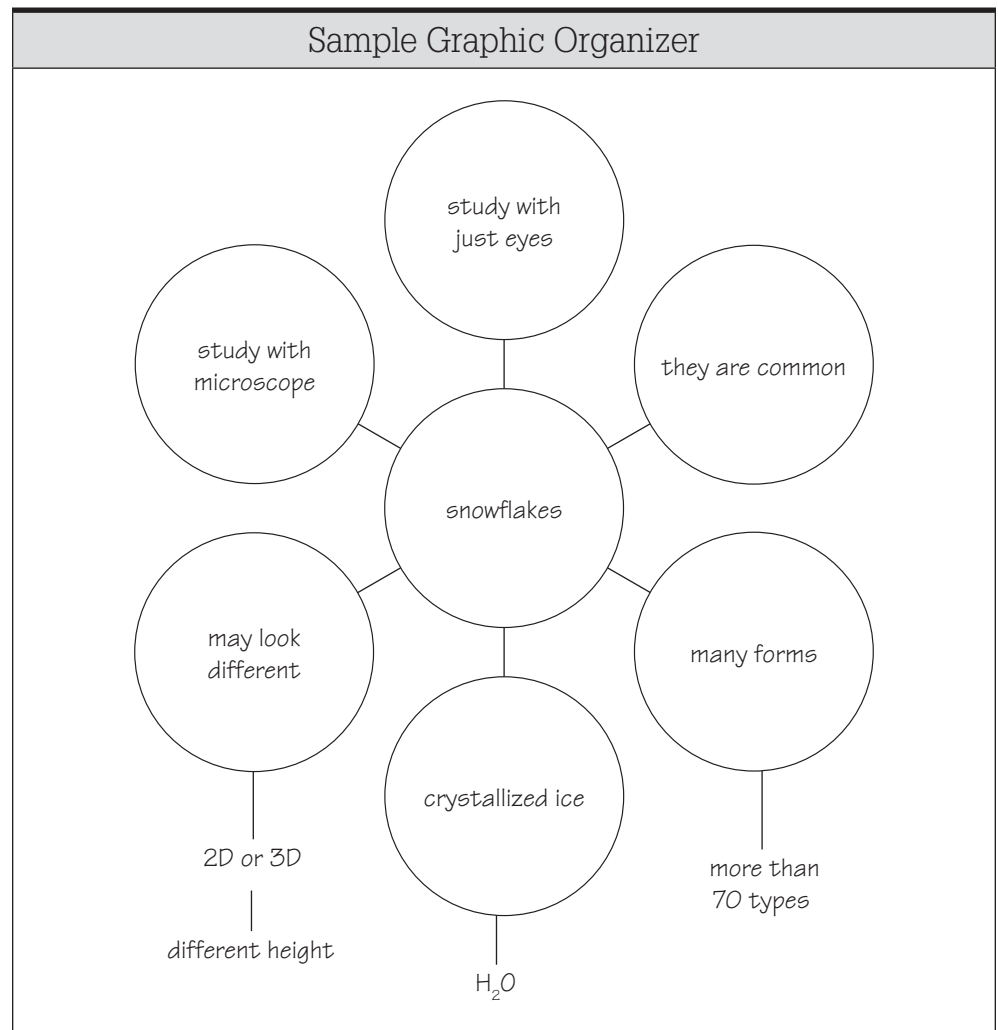
**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.

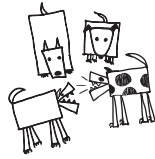
Use **Random Reporter** to debrief.

4. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

A sample graphic organizer follows.





# Teamwork tp

(20 minutes)

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

## Partner Prep

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: sr  
**page 13 aloud with partners.**
2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

## Team Discussion

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. sr
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team's strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team's graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students' reflection as they determine the meaning of the "(Write)" question.

### Team Talk Questions

1. What do all snowflakes have in common? **(Write) [CV, RE, SA]** (Team Talk rubric)
 

100 = **According to the section "A Crystalline Echo" on page 12, all snowflakes are crystallized ice. Another thing they have in common is that all snowflakes have a hexagonal or six-sided shape. The researcher, Libbrecht, says this is because the water molecules "like to stack a certain way." Although not all snowflakes are the same, they all are crystallized ice and hexagons.**

90 = "A Crystalline Echo" on page 12 says all snowflakes are crystallized ice. All snowflakes have a hexagonal shape.

80 = They are crystallized ice and hexagonal.

*continued*

Team Talk Questions *continued*

2. Where are you most likely to see frost form: single-paned or double-paned windows? Why? **[DC, SA]** (Team Talk rubric)

100 = *You are more likely to see frost form on single-paned windows because they are more easily cooled. Single-paned windows are cooled by outside **temperatures**, and water vapor that forms on the inside of the window freezes into frost crystals. Double-paned windows have an extra layer between the glass panes that **insulates** the house side from getting cold enough for frost to form.*

90 = *You are more likely to see frost form on single-paned windows because they are more easily cooled. Single-paned windows are cooled by outside air, and water vapor that forms on the inside of the window freezes into frost crystals.*

80 = *You are more likely to see frost form on single-paned windows because they are more easily cooled.*

3. What role do dust particles play in the formation of snowflakes? **[MI, RE]** (Team Talk rubric)

100 = *Dust particles are the starters for the snowflake formation. Water vapor condenses on dust particles in a cloud and forms droplets. When the temperature in the cloud cools to the freezing point, a droplet becomes an ice particle. Droplets that then evaporate change directly from gas to solid form and crystallize on the ice particle to form a snowflake. **According to the text**, a droplet freezing on a dust particle provides a guide for the formation of snowflakes.*

90 = *Dust particles are the starters for the snowflake formation. Water vapor condenses on dust particles in a cloud and form droplets. When the temperature in the cloud cools to the freezing point, a droplet becomes an ice particle. Droplets that then evaporate change directly from gas to solid form and crystallize on the ice particle to form a snowflake.*

80 = *Dust particles are the starters for the snowflake formation.*

4. Why do you think the author included the text box at the bottom of page 13? **[AP, DC, SA]** (Team Talk rubric)

100 = *I think the author included the text box on page 13 because it **provides a visual** for the information described in the **sections** "A Crystalline Echo" and "Made in a Cloud." The author describes different **appearances** of snowflakes, and seeing it helps the reader better understand the many ways a snowflake may look. She also discusses how snowflakes form, and the visual shows that **despite** forming the same way, snowflakes' appearances may **differ**. If the text box was not included, it would be hard to **visualize** all the ways a snowflake can look.*

90 = *I think the author included the text box on page 13 because it shows pictures for the information in "A Crystalline Echo" and "Made in a Cloud." The author describes different ways snowflakes can look, and seeing it helps the reader better understand. The picture shows that snowflakes form the same way but can look different.*

80 = *It shows pictures of information in "A Crystalline Echo" and "Made in a Cloud."*

Cue students to discuss strategy use, graphic organizers, and word power journals.

**Randomly select team representatives who will share:**

- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection



Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

4. Have students thoroughly discuss Team Talk questions before they write individual answers to the skill question marked “(Write).” Allow students to revise their written answers after further discussion if necessary.
5. Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.
6. Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
7. If some teams finish ahead of others, have them practice their fluency.
8. Award team celebration points for good team discussions that demonstrate 100-point responses.



## Class Discussion tp

(18 minutes)

### Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.

### Celebrate

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

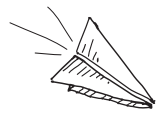
- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Lesson 2

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

### Teacher Background

Today students will read the last section of the “Seeing Snow” article that they started in lesson 1. This section poses the question “Are any exactly alike?” in regard to the appearance of snowflakes. How temperature and humidity affect snowflakes is explained. There is also a discussion of symmetry and whether snowflakes are symmetrical. An accompanying diagram provides a visual for the different snowflake shapes that exist based on supersaturation and temperature.



## Active Instruction tp

(25 minutes)

Students use the **vocabulary study routine to rate their knowledge of each vocabulary word:**

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don't know this word; it's totally new to me.

Teams discuss their vocabulary ratings.



Introduce vocabulary.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they copy the words in their word power journals and rate their knowledge of each as they arrive for class.
2. Spot check the Read and Respond homework.

### Vocabulary

1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a “+” and a word the entire team rated with a “?”.
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Award team celebration points.
3. Introduce the vocabulary for this cycle. Read each word aloud, and model chunking as needed. Then read the meaning of each word.

Word	Pronunciation	Definition	Sample Sentence
<b>crystallized</b> (adjective) page 12	crys-tal-lized (KRIS-tal-ahyzd)	formed into crystals	Rock candy is made from <i>crystallized</i> sugar that resembles rock crystals.
<b>hexagon</b> (noun) page 12	hex-a-gon (HEK-suh-gon)	a shape having six angles and six sides	A beehive honeycomb is often the shape of a <i>hexagon</i> .

*continued*

Word	Pronunciation	Definition	Sample Sentence
<b>minuscule</b> (adjective) page 15	mi-nus-cule (MIN-uh-skyool)	very small	Jack used a <i>minuscule</i> amount of pepper because he didn't like his food too spicy.
<b>correlation</b> (noun) page 15	cor-re-la-tion (KAWR-uh-LEY-shuhn)	a relationship between two things	Mrs. Tonner says there's a <i>correlation</i> between studying a lot and getting good grades.
<b>symmetry</b> (noun) page 16	sym-me-try (SIM-i-tree)	when two parts of something are exactly the same	When Min sliced the pizza down the middle, the two halves had perfect <i>symmetry</i> .
<b>hypothesized</b> (verb) page 16	hy-poth-e-sized (hahy-POTH-uh-sayhzd)	made a guess about something	Shara <i>hypothesized</i> that it would rain on Friday since it had rained every day that week.
<b>behemoths</b> (noun) page 18	be-he-moths (bih-HEE-muhths)	anything of a huge size	Marcus's trucks are <i>behemoths</i> that are difficult to park, especially in small parking spaces.
<b>geothermal</b> (adjective) page 18	ge-o-ther-mal (jee-oh-THUR-muhl)	relating to the heat of the earth	In Iceland, <i>geothermal</i> energy is used to heat greenhouses that produce fruits and vegetables.

- Use **Random Reporter** to have teams share a new sentence that uses one of their vocabulary words. Award team celebration points.
- Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

Review Vocabulary Vault.

Teams review their cycle goal.

Post and present the reading objective.



Review the skill as necessary.

**Teacher:** Read aloud and think aloud to model target skill or strategy use within the TIGRRS process.

**Students:** Actively listen.

**Teacher:** Restate important ideas in the text, and add notes to the graphic organizer.



**Set the Stage**

1. Ask students to review their team’s goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and reading objective.
4. Refer teams to the Predicting Strategy card and have teams discuss and report on their preview of the text and explain their thinking. Use **Random Reporter** to share team responses.

**T:** Shapes of snowflakes. The text box asks “Are any exactly alike?”

**I:** To inform the reader about the answer to the question “Are any exactly alike?” This question is in large letters at the top of the page, so it’s probably important.

**G:** It seems like a web would work since there will probably be information about different kinds of snowflakes.

**Interactive Read Aloud**

1. Refer students to the reading objective.

**Remember that we are clarifying the meaning of words and phrases used in the text. This will help us understand the processes described in the text.**

2. Read page 15 (stopping before the bullets) aloud. A sample Think Aloud follows.

Sample Think Aloud
<p>(Begin by reading the text box at the top of page 15, and stop at “Certain shapes form...”)</p> <p>A word I just read that I’m not sure about is <i>humidity</i>. Libbrecht explains that no two snowflakes have ever been exactly alike. He says that this is because of temperature and humidity. It seems like humidity is important because it causes snowflakes to be different. I know that temperature is how hot or cold it is. Maybe humidity is related to temperature. I also see the word <i>humid</i> in <i>humidity</i>. I know that <i>humid</i> is a weather word. It’s kind of like hot. Maybe humidity is how hot it feels. I’m not sure. I’ll read on to see if I can find out for sure. I see a lot of words defined in bubbles. Maybe this word will be defined later on. (Continue reading until you get to the bulleted section. Stop there.)</p>

3. Use **Think-Pair-Share** to ask:

**How was the skill used?**

*The word humidity was identified as a word that needed to be clarified.*

**Why was clarifying *humidity* important? Could the word still be clarified further?**

*Clarifying humidity was important because it was mentioned as being a reason that snowflakes aren’t alike. It seems to have a pretty important effect.*

*This word can be clarified further. You can read on to see if what you think it means is correct.*

**Do you think you can use this skill only when reading scientific texts, or would this help in other classes too?**

*I think this skill would help in other classes too. Clarifying words isn't just for scientific texts. You could read a book in English class and need to clarify a word. You might need to clarify words in social studies and even math class too.*

**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.

4. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read the four bullets and the last paragraph on page 15.

Use **Think-Pair-Share** to ask:

**Were there any terms that you clarified?**

*(Answers may vary.) I had to clarify freezing point. I think this is when something is able to freeze. A point is when something happens, like a point in time. The crystals look like plates when the temperature is cold enough (at its freezing point) for things to freeze.*

**Did clarifying words help you understand anything else in the text?**

*(Answers may vary.) Clarifying humidity helped me understand the different shapes that snowflakes have. The article explained that humidity is the amount of water vapor in the air. When the humidity is higher, unique shapes are created. So the more water vapor there is, the more interesting the shape of the snowflake. But when there's less water vapor, snowflake are simple shapes. So less water vapor means lower humidity.*

Use **Random Reporter** to debrief.

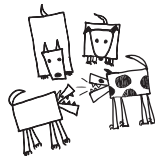
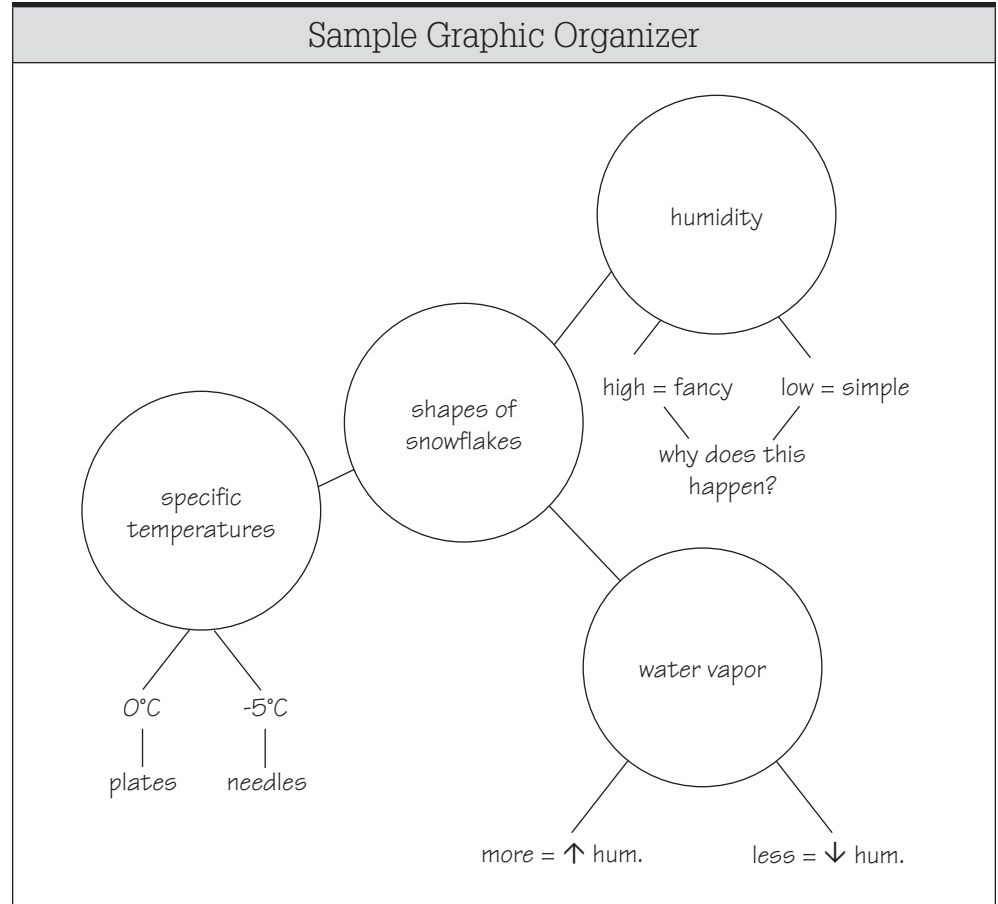
5. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

A sample graphic organizer follows.



**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.



## Teamwork tp

(20 minutes)

### Partner Prep

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: sr  
**page 16 aloud with partners.**
2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

Cue students to use their student routines for strategy use and Team Talk discussion.

### Team Discussion

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. **Sf**
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team's strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team's graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students' reflection as they determine the meaning of the "(Write)" question.

#### Team Talk Questions

1. What conditions are needed for two snowflakes to be symmetrical? **[DC, RE, SA]**  
(Team Talk rubric)
 

100 = *For two snowflakes to be symmetrical, very **specific** conditions are needed. The conditions **include** temperature, humidity, and time. Snowflakes must be exposed to the same temperature and humidity at the same time for the same amounts of time. If these conditions are not met, snowflakes may **appear** symmetrical but not **truly** be symmetrical. There are very specific conditions needed for snowflakes to be symmetrical.*

90 = *For two snowflakes to be symmetrical, a lot of conditions are needed. The conditions are temperature, humidity, and time. Snowflakes must be exposed to the same temperature and humidity at the same time for the same amounts of time.*

80 = *To be symmetrical, there are a lot of conditions. They are temperature, humidity, and time.*
2. Why is the chamber that Professor Libbrecht built important? **[MI, DC, SA]**  
(Team Talk rubric)
 

100 = *The chamber that Professor Libbrecht built is important because it **allows** him to learn about snowflakes. In the chamber, he can both control and maintain a **variety** of temperatures and humidity levels. **As a result**, he can hold a snowflake on a wire, move it a little, and watch it grow. He can make **observations**, such as that a hexagon might grow branches in one area of the chamber but not in another. Without this chamber, Professor Libbrecht might not be able to study snowflakes as closely.*

90 = *The chamber that Professor Libbrecht built is important because it helps him learn about snowflakes. In the chamber, he can both control and maintain a lot of temperatures and humidity levels. He can hold a snowflake on a wire, move it a little, and watch it grow. He can see what happens.*

80 = *It helps him learn about snowflakes.*

*continued*

Team Talk Questions *continued*

3. Now that Professor Libbrecht is able to view snowflakes up close in his chamber, does this mean that he doesn't have any more to learn? Explain. **[DC, RE, SA]** (Team Talk rubric)

100 = **Although** Professor Libbrecht can view snowflakes up close in his chamber, he still has a lot to learn. He knows that temperature and humidity affect crystal growth, but he doesn't know the **reason** for this. He thought a **possible** reason was chemical impurities in the air, but his research didn't **support** his hypothesis. **Therefore**, he **created** a new hypothesis about how air pressure affects crystal growth. **Despite** having built the special chamber, there is still more that Professor Libbrecht wants to know.

90 = Professor Libbrecht can view snowflakes up close in his chamber, but he still has a lot to learn. He knows that temperature and humidity affect crystal growth, but he doesn't know why. He thought it was chemical impurities in the air, but his research didn't show this was true. He made a new guess.

80 = He still has a lot to learn. He knows that temperature affects crystal growth, but he doesn't know why.

4. Looking at the diagram on page 16, what morphology of snowflakes would you expect at 0°F and a humidity level of 0.2 g/m<sup>3</sup>? How do you know? **(Write)** **[CV, RE]** (Team Talk rubric)

100 = I would expect the morphology of the snowflakes to be sectored plates because when I trace a line from the **temperature** of 0°F and another from the supersaturation or humidity of 0.2 g/m<sup>3</sup>, they **intersect** very close to sectored plates on the diagram. Using the different **axes** on the graph helped me figure out the morphology of snowflakes at 0°F.

90 = I would expect it to be sectored plates because when I trace a line from 0°F and another from the humidity of 0.2 g/m<sup>3</sup>, they meet close to sectored plates on the diagram.

80 = It would be sectored plates. They meet near sectored plates.

5. Choose a word from the vocabulary list and write a meaningful sentence using the word correctly. **[CV]**

Accept a sentence that shows the student knows the meaning of the word and can use it correctly. For example, there is a correlation between practicing a lot and playing a sport well, so I practice soccer every day.

4. Have students thoroughly discuss Team Talk questions before they write individual answers to the skill question marked "(Write)." Allow students to revise their answers after further discussion if necessary.
5. Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.

Cue students to discuss strategy use, graphic organizers, and word power journals.

6. Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
7. If some teams finish ahead of others, have them practice their fluency.
8. Award team celebration points for good team discussions that demonstrate 100-point responses.



## Class Discussion tp

(15 minutes)

Randomly select team representatives who will share:

- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection



Show the video.



Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

### Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.
3. Show video “Team Talk Response.”

### Celebrate

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

Word	Pronunciation	Definition	Sample Sentence
<b>crystallized</b> (adjective) page 12	crys-tal-lized (KRIS-tal-ahyzd)	formed into crystals	Rock candy is made from <i>crystallized</i> sugar that resembles rock crystals.
<b>hexagon</b> (noun) page 12	hex-a-gon (HEK-suh-gon)	a shape having six angles and six sides	A beehive honeycomb is often the shape of a <i>hexagon</i> .
<b>minuscule</b> (adjective) page 15	mi-nus-cule (MIN-uh-skyool)	very small	Jack used a <i>minuscule</i> amount of pepper because he didn't like his food too spicy.
<b>correlation</b> (noun) page 15	cor-re-la-tion (KAWR-uh-LEY-shuhn)	a relationship between two things	Mrs. Tonner says there's a <i>correlation</i> between studying a lot and getting good grades.
<b>symmetry</b> (noun) page 16	sym-me-try (SIM-i-tree)	when two parts of something are exactly the same	When Min sliced the pizza down the middle, the two halves had perfect <i>symmetry</i> .
<b>hypothesized</b> (verb) page 16	hy-poth-e-sized (hahy-POTH-uh-sayhzd)	made a guess about something	Shara <i>hypothesized</i> that it would rain on Friday since it had rained every day that week.
<b>behemoths</b> (noun) page 18	be-he-moths (bih-HEE-muhths)	anything of a huge size	Marcus's trucks are <i>behemoths</i> that are difficult to park, especially in small parking spaces.
<b>geothermal</b> (adjective) page 18	ge-o-ther-mal (jee-oh-THUR-muhl)	relating to the heat of the earth	In Iceland, <i>geothermal</i> energy is used to heat greenhouses that produce fruits and vegetables.

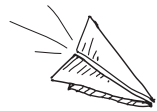
## Lesson 3

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

### Teacher Background

Today’s article, “Attack of the Real Snow Monster,” is about glaciers. The article explains where glaciers originate, that they even occur in warm climates, contrary to popular belief, and the effect of geothermal energy on glaciers. The article also describes the destruction that glaciers are capable of causing and how glaciers retreat, seemingly mysteriously.

During Active Instruction show the video “Science Nation: Ice Core Lab” to build background about what can be discovered by studying ice from Antarctic glacier ice cores.



## Active Instruction

(25 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don’t know this word; it’s totally new to me.

Teams discuss their vocabulary ratings.



Model exploring a word in the word power journal.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

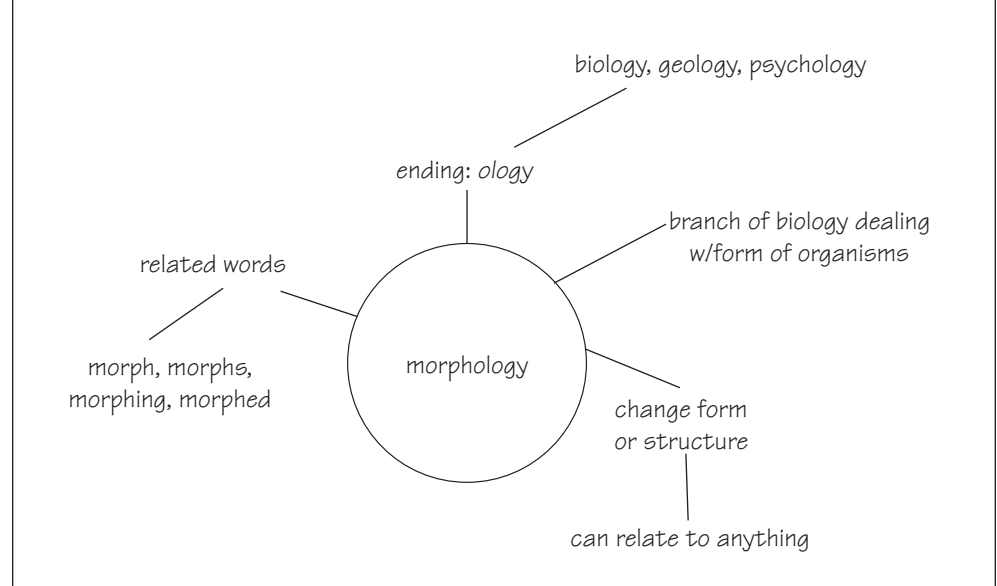
### Vocabulary

1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a “+” and a word the entire team rated with a “?”.
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Use **Random Reporter** to have teams report on a new sentence using a vocabulary word. Award team celebration points.
3. Choose an important word from the text or class discussion, and model how to explore it in a word power journal entry. A sample Think Aloud and word map follow.

Sample Think Aloud

A word that I wasn't sure about while reading is *morphology*. This was used in the article we read in our last lesson. When I first saw the word, I thought of the word *morph* immediately. I think *morph* means change, but I'm not positive. You could say a person morphs into someone else if he or she is acting weird. So I have an idea about part of the word. There's also that ending *-ology*. I've seen this ending in a lot of words like *biology*, *geology*, and *psychology*. I think this ending means study of. Maybe morphology is the study of change. I'm not sure. Since I have an idea now, I think I'll check the dictionary. (Model looking up *morphology* in a dictionary.) There are a few definitions. One is the branch of biology dealing with the form of organisms. The next is the patterns of word formation. Another is the form or structure of anything. In the article we read, I think that third definition makes the most sense. We were learning about the form of snowflakes, or the morphology of snowflakes.

Sample Word Map



Review Vocabulary Vault.

4. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

Teams review their cycle goal.

Post and present the reading objective.



Build background about ice cores.



Show the video.



**Teacher:** Read aloud.

**Students:** Practice the skill or strategy.



**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.

### Set the Stage

1. Ask students to review their team's goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and reading objective.
4. Refer teams to the Predicting Strategy card and have teams discuss and report on their preview of the text and explain their thinking. Use **Random Reporter** to share team responses.

**T:** Glaciers. The word *glacier* is repeated many times. There is a picture of a big piece of ice.

**I:** To inform the reader about glaciers. The headings of the different sections either ask questions or have a statement about glaciers. Each section probably explains something about glaciers.

**G:** A web because it doesn't seem like there's a sequence. It seems like different things will be explained about glaciers.

5. Build background about what can be learned by studying glacier ice cores from Antarctica. Show the video "Science Nation: Ice Core Lab." Use **Think-Pair-Share** to debrief.

#### Why do scientists study ice cores from Antarctica?

*They can learn about what the weather and atmosphere was like thousands of years ago from dust and air bubbles trapped and preserved in the ice. They can learn about how climate has changed in the past to figure out what effects it will have on us.*

### Interactive Read Aloud

1. Read the first two sections on page 18 ("Look out!" and "Where Did These Giants Come From?") aloud.

Use **Think-Pair-Share** to ask:

#### What is an accumulation zone, and how did you clarify this term?

*An accumulation zone is an area where a lot of snow is piling up, or gathering. I haven't read the word accumulation that often, but sometimes my mom tells me not to let too many papers accumulate in my binder. When she says this, she means that I shouldn't let too many papers pile up. My prior knowledge helped me understand that in an accumulation zone, there is a lot of snow.*

2. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read "They're Everywhere!" Use **Think-Pair-Share** to ask students how they clarified the meaning of *tropical*.

**The article explains that glaciers can occur in tropical places. What is a tropical place like? How did you know?**

*A tropical place is a place that is very warm. I used background knowledge because I am interested in visiting Hawaii, which is very warm and is thought of as a tropical place. I also used context because it says most people think of glaciers as being in places like the frozen North. It is very cold there. Then it says that glaciers can occur even in tropical places. Even is a signal word that there is a contrast. The signal word gave me an idea about the sentence's context.*



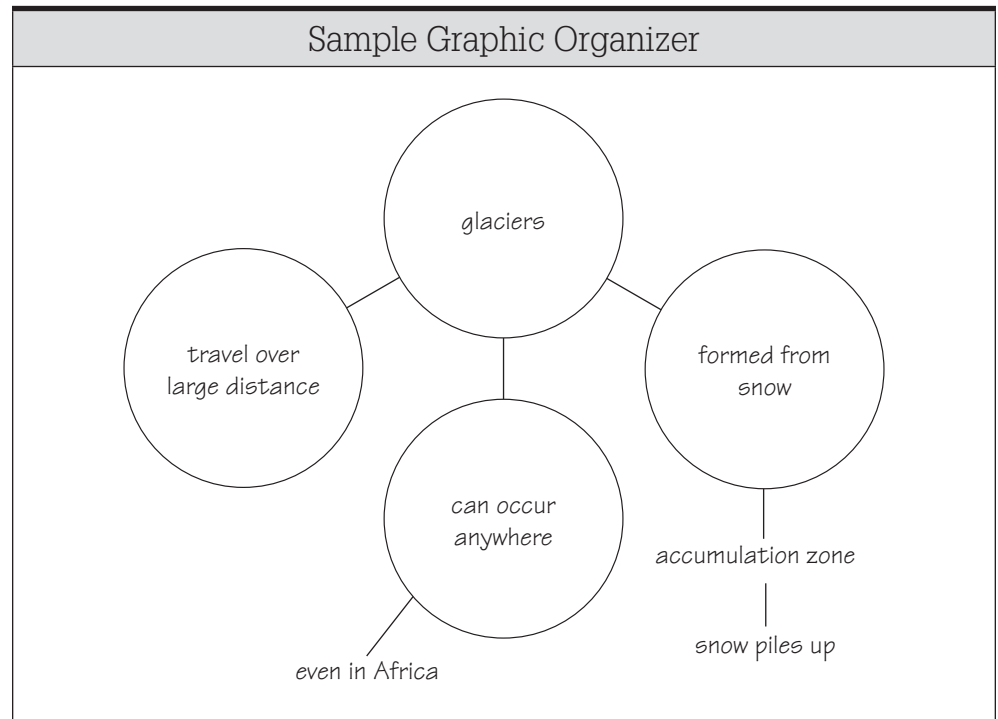
**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.

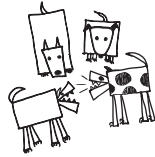
Use **Random Reporter** to debrief.

3. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

A sample graphic organizer follows.





# Teamwork tp

(20 minutes)

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

## Partner Prep

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: sr  
**pages 18 (starting at “Yikes! It Seems to Be...Moving!”) and 19 aloud with partners.**
2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

## Team Discussion

Cue students to use their student routines for strategy use and Team Talk discussion.

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. sr
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team’s strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team’s graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students’ reflection as they determine the meaning of the “(Write)” question.

### Team Talk Questions

1. Explain the connection between geothermal energy and the movement of glaciers. **(Write) [CV, RE]** (Team Talk rubric)

*100 = Geothermal energy causes glaciers to move. Geothermal energy is heat from the earth. It helps the ice deep in a glacier to melt. This **creates** a layer of water between the base of the glacier and the bedrock underneath it. The water is like a **lubricant** that helps the glacier move or slide down a slope. Without geothermal energy, there might not be movement of glaciers.*

*90 = Geothermal energy causes glaciers to move. Geothermal energy helps the ice deep in a glacier to melt. This makes a layer of water between the base of the glacier and the bedrock underneath it. The water helps the glacier move down a slope.*

*80 = Geothermal energy causes glaciers to move.*

*continued*

Team Talk Questions *continued*

2. Describe the effects of glaciers moving within ice itself. **[DC, SA]** (Team Talk rubric)

100 = *Glaciers moving within ice itself has **several** effects. **Due to the way** glaciers travel, ice crystals constantly twist past each other. **This results in pressure and stretching in the ice.** The twisting can open a crevasse. **Crevasses provide information, such as that the upper layer of a glacier is brittle and that the ice below stretches more smoothly.** The way glaciers move **reveals a lot about ice.***

90 = *Glaciers moving within ice itself has a lot of effects. Ice crystals constantly twist past each other, so there is pressure and stretching. The twisting can open a crevasse. Crevasses show information about the glacier.*

80 = *Ice crystals constantly twist past each other. The twisting can open a crevasse.*

3. What is the main idea of "It's Left a Path of Destruction!"? How did you identify the main idea? **[MI, SA]** (Team Talk rubric)

100 = *The main idea of this section is that glaciers can cause destruction. The section title gave me an idea of what the section would **discuss**. There were **several** examples of types of destruction that glaciers cause. **For example, they carry large boulders long distances and deposit them anywhere. Also, they trap and crush human-made objects, such as ships.** I used the section title and the details given to identify the main idea.*

90 = *The main idea of this section is that glaciers can cause destruction. The section title gave me an idea of what the section would be about. There were a lot of examples of types of destruction that glaciers cause. They trap and crush objects.*

80 = *Glaciers create a lot of destruction. There were a lot of examples of this.*

4. As used on page 19 in the sentence "Glaciers are also immensely heavy," *immensely* most nearly means— **[CV, SA]**

- A. extremely.
- B. slightly.
- C. strangely.
- D. beautifully.

Explain how you determined the meaning of *immensely*.

100 = *I determined the meaning of immensely by using context clues and background knowledge. The article says that mile-deep ice can weigh more than 110 tons. I know that one ton is a great amount, and something weighing just one ton would be very heavy. Therefore, I eliminated slightly. The glacier's weight is discussed, so C and D didn't make sense. The sentence was not talking about how a glacier looked. Thinking about the context and what I already knew helped me determine that immensely means extremely.*

90 = *I determined the meaning of immensely by using context clues and background knowledge. Mile-deep ice can weigh more than 110 tons. Something weighing just one ton would be very heavy. The glacier's weight is discussed, so C and D didn't make sense.*

80 = *I used context clues and background knowledge.*

Cue students to discuss strategy use, graphic organizers, and word power journals.

**Randomly select team representatives who will share:**

- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection

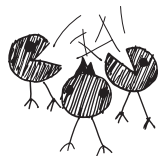


Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

4. Have students thoroughly discuss Team Talk questions before they write individual answers to the skill question marked “(Write).” Allow students to revise their written answers after further discussion if necessary.
5. Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.
6. Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
7. If some teams finish ahead of others, have them practice their fluency.
8. Award team celebration points for good team discussions that demonstrate 100-point responses.



## Class Discussion tp

(15 minutes)

### Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.

### Celebrate

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

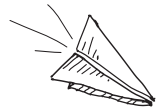
- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Lesson 4

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

**Teacher Background**

Today's article, "Make an Iceberg...Save a Glacier—All With Ice Cubes," includes three different labs that provide ways to learn about ice science. Lab #1 shows that an ice cube floats in water but gets students thinking about how much of the floating cube is below the water. This idea is connected to the effect of gravity on an object in water. The purpose of Lab #2 is to show that the shape of ice affects its movement. Finally, Lab #3 uses ice cubes in tumblers both with and without water to demonstrate the idea of different water levels. This is connected to climate change.

**Active Instruction** 

(25 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don't know this word; it's totally new to me.

Teams discuss their vocabulary ratings.



Review Vocabulary Vault.

Teams review their cycle goal.

Post and present the reading objective.

**Partner Vocabulary Study**

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

**Vocabulary**

1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a "+" and a word the entire team rated with a "?."
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Use **Random Reporter** to have teams report on a new sentence using a vocabulary word. Award team celebration points.
3. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

**Set the Stage**

1. Ask students to review their team's goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and reading objective.



4. Refer teams to the Predicting Strategy card and have teams discuss and report on their preview of the text and explain their thinking. Use **Random Reporter** to share team responses.

**T:** Experiments with ice. Headings say Lab #1, Lab #2, and Lab #3. There are pictures of ice cubes in glasses, and the top of the page has the words *iceberg*, *glacier*, and *ice cubes*.

**I:** To teach the reader how to do experiments.

**G:** Since the article is about experiments, there will probably be steps for how to do them. A sequence chain is a way to organize things that should be done in a certain order.

5. Use **Think-Pair-Share** to ask:

**Have you ever done an experiment? If so, what kind of experiment did you do?**

*(Answers will vary.) I did an experiment where I had to build a container that would hold an egg and protect it from breaking when dropped. I had to drop the container from a certain height to see if it would protect the egg inside. I learned about the concept of force by doing this experiment.*

**What is the purpose of doing an experiment?**

*(Answers may vary.) The purpose of an experiment is to answer a question or to test an idea. The results of an experiment might teach you something.*

### Interactive Read Aloud

1. Read Lab #1 on page 24 aloud. Use **Think-Pair-Share** to prompt use of the skill or strategy.

Use **Think-Pair-Share** to ask:

**What did you need to clarify as I read?**

*(Answers may vary.) I needed to clarify fraction. The lab asked me to estimate the fraction of an ice cube below the water. I know that in math, fractions relate to parts of a whole. So I had to estimate what part of the whole cube was below the water.*

2. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read Lab #2. Use **Think-Pair-Share** to ask:

**What words did you have to clarify in this lab?**

*(Answers may vary.) I had to clarify the words jagged, expose, and faces. For this lab, it said to use broken and jagged cubes. Because the cubes are broken, I figured that jagged might mean that the cubes are not in perfect shape. It said a squarish cube will expose different faces. I wasn't sure about expose. Since the cube is turning, it seems like different sides are shown. And faces might mean the different sides of a cube.*

Build background about experiments.



**Teacher:** Read aloud.

**Students:** Practice the skill or strategy.



**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.



**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.

**How did clarifying words help you understand the lab?**

*Clarifying words helped me understand the lab because it helped me understand what is needed for the lab and what happens when the experiment is done (faces are shown).*

Use **Random Reporter** to debrief.

3. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

A sample graphic organizer follows.

Sample Graphic Organizer
<p style="text-align: center;"><b>Sequence Chain</b></p> <p><b>Title:</b> <u>Lab #1: Expand Your Knowledge</u></p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Fill a tumbler almost to the top with cold water, and add an ice cube.</div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Watch as the ice cube floats.</div> <p style="text-align: center;">↓</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;">Estimate the fraction of the ice cube that is below the water.</div>

**Title:** *Lab #2: Give That Berg a Spin*

Gather ice cubes with different shapes, such as broken, two stuck together, etc.



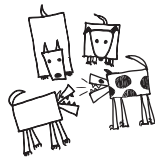
Float each cube in a tumbler of cold water.



Use a spoon to roll over each cube and see if it floats with different faces up.



Notice the difference in how the cubes float.



## Teamwork tp

(20 minutes)

### Partner Prep

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: **sr** **page 25 (Lab #3 and text box) aloud with partners.**
2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

Cue students to use their student routines for strategy use and Team Talk discussion.

**Team Discussion**

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. **Sf**
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team’s strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team’s graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students’ reflection as they determine the meaning of the “(Write)” question.

Team Talk Questions
<p>1. How does specific gravity relate to icebergs? <b>(Write) [CV, RE]</b> (Team Talk rubric)</p> <p><i>100 = Specific gravity affects whether icebergs sink or float. Water has a specific gravity of 1.00, and ice has a little less than 1.00. An <b>object</b> with a specific gravity of 1.00 or less will float, <b>while</b> an object over 1.00 will sink. This is why icebergs float. The specific gravity can cause objects to either float or sink.</i></p> <p><i>90 = Specific gravity affects whether icebergs sink or float. Water has a specific gravity of 1.00, and ice has a little less than 1.00. Something that is 1.00 or less will float. Something that is over 1.00 will sink.</i></p> <p><i>80 = It affects whether icebergs sink or float.</i></p> <p>2. In Lab #2, how would the results be different if you only used ice cubes with the same shape? <b>[DC, SA]</b> (Team Talk rubric)</p> <p><i>100 = If you only used ice cubes with the same shape for Lab #2, the results would be different because the way the cube moves <b>depends</b> on its shape. <b>For example</b>, if you just used squarish cubes and rolled them over, you would see many faces <b>exposed</b>, but you would not see the different effect of cubes with different shapes. Using the different shapes helps you see how the shape of an ice cube affects its movement.</i></p> <p><i>90 = If you only used ice cubes with the same shape for Lab #2, the results would be different because the way the cube moves is because of its shape. If you just used squarish cubes and rolled them over, you would only see many faces shown.</i></p> <p><i>80 = The way the cube moves depends on its shape.</i></p>

*continued*

Team Talk Questions *continued*

3. Is there a connection between the labs you read about and the *Titanic* disaster? **[DC, SA]** (Team Talk rubric)

100 = *Yes, there is a connection between Lab #2 and the Titanic disaster because of how the ship floated. The purpose of Lab #2 is to show how the shape of ice affects its movement. For example, long pieces of ice roll. Since the iceberg that the Titanic struck may have been long and flat above the water, not tall and jagged as commonly believed, it would have been hard to see. A result in Lab #2 makes the Titanic disaster easier to understand.*

90 = *Yes, there is a connection between Lab #2 and the Titanic disaster because of how the ship floated. Lab #2 shows how the shape of ice affects its movement. Long pieces of ice roll. The iceberg that the Titanic struck may have been long and flat above the water, so it would have been hard to see.*

80 = *Yes, because of how the ship floated.*

4. What is the purpose of Lab #3? What is the author's main point? **[MI, RE]** (Team Talk rubric)

100 = *The purpose of Lab #3 is to demonstrate that when ice melts in water, it does not add to the water level. When ice melts in the glass without water, it increases the water level. The author's main point is that icebergs melting in water do not cause sea levels to rise. However, glaciers or ice sheets that melt on land add water to the ocean and cause sea levels to rise. That affects coastal areas. Lab #3 shows how ice melting affects water level.*

90 = *The purpose of Lab #3 is to show that when ice melts in water, it does not add to the water level. When ice melts in the glass without water, it adds to the water level. The author's main point is that icebergs melting in water do not cause sea levels to rise.*

80 = *To show that when ice melts in water, it does not add to the water level. The author's point is that icebergs melting do not cause sea levels to rise.*

5. Mrs. DiMarco does not like her tea too sweet, so she only put in a \_\_\_\_\_ amount of honey. **[CV]**

Choose the word that belongs in the blank. Explain your choice.

- A. geothermal
- B. crystallized
- C. minuscule
- D. hexagon

*Minuscule belongs in the blank because it means very small. If she doesn't like her tea very sweet, she would just put in a very small amount of honey.*

Cue students to discuss strategy use, graphic organizers, and word power journals.

Randomly select team representatives who will share:



- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

4. Have students thoroughly discuss Team Talk questions before they write individual answers to the skill question marked “(Write).” Allow students to revise their written answers after further discussion if necessary.
5. Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.
6. Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
7. If some teams finish ahead of others, have them practice their fluency.
8. Award team celebration points for good team discussions that demonstrate 100-point responses.



## Class Discussion tp

(15 minutes)

### Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.

### Celebrate

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

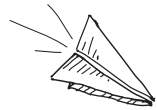
- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Lesson 5

**Writing Objective:** Use key scientific terms and definitions from the text to explain a process.

### Teacher Background

The writing project requires students to use some of the science vocabulary they've learned from reading various articles throughout the cycle to respond to a prompt that ties together what they've learned.



## Active Instruction

(10 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don't know this word; it's totally new to me.

Teams discuss their vocabulary ratings.



Review Vocabulary Vault.

Teams review their cycle goal.

Post and present the writing objective.

Introduce the writing project.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

### Vocabulary

1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a "+" and a word the entire team rated with a "?."
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Award team celebration points.
3. Use **Random Reporter** to have teams share a new sentence that uses one of their vocabulary words. Award team celebration points.
4. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

### Set the Stage

1. Ask students to review their team's goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and writing objective.
4. This cycle, we have read many articles that used scientific words. We read about snowflakes, glaciers, and icebergs. We learned about different processes involving snowflakes, glaciers, and icebergs. Our writing objective is to use scientific terms and definitions to explain a process. You will have a chance to do this today by responding to the prompt, which asks you to explain how temperature affects snowflakes, glaciers, and icebergs.

Read the prompt aloud.



Students identify the purpose for writing.

Refer student to the appropriate writer's guide in their student editions.

Highlight the writing objective.

- Refer students to the following writing prompt in their student editions. Read the writing prompt aloud.

Writing Prompt
Explain how temperature affects snowflakes, glaciers, and icebergs.

Use **Think-Pair-Share** to ask:

**Read the prompt. What is it asking you to do: support a claim with reasons, explain ideas or information on a topic, or write a literary response? How do you know?**

*The prompt is asking me to explain information on a topic. The prompt says "Explain how." The topic is how temperature affects snowflakes, glaciers, and icebergs. I will need to explain how temperature affects these forms and what results varying temperatures have.*

- Refer students to the following writer's guide in their student editions. Point out that this guide for Writing to Inform or Explain is the criteria for writing. Point out that using the writer's guide will help them write a quality response.

Writing to Inform or Explain	
<b>Ideas</b>	<ul style="list-style-type: none"> <li>Clearly introduce the topic.</li> <li>Develop the topic with relevant details.</li> </ul>
<b>Organization</b>	<ul style="list-style-type: none"> <li>Begin by introducing the topic.</li> <li>In the middle, provide facts, examples, or events that help a reader understand the information.</li> <li>End with a closing statement that supports the information.</li> </ul>
<b>Style</b>	<ul style="list-style-type: none"> <li>Use words and phrases that help a reader understand how the facts or events are related.</li> <li>Include details or examples that help a reader make a mind movie.</li> </ul>
<b>Mechanics</b>	<ul style="list-style-type: none"> <li>Use correct punctuation, capitalization, spelling, and grammar.</li> </ul>

Briefly review the guide, noting the four aspects of writing: ideas, organization, style, and mechanics.

Use **Think-Pair-Share** to ask:

**Which guidelines relate to our writing objective, using key scientific terms and definitions from the text to explain a process?**

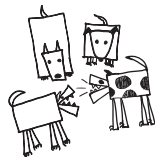
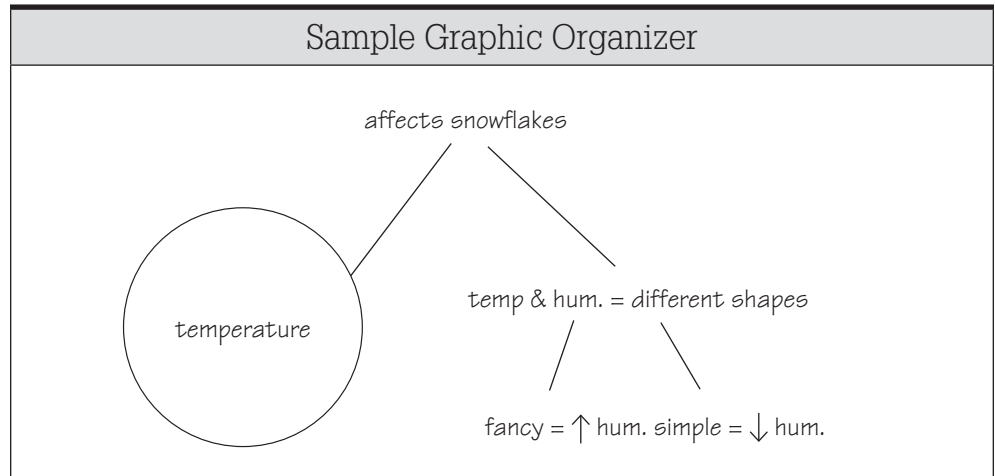
*Ideas and organization relate to our writing objective. Ideas says to develop the topic with relevant details, so I will use scientific terms to do that. Organization says to provide examples that support the topic. Scientific terms will be included in the examples.*

- Tell students that this 10-minute writing project is practice to prepare them to write a quality answer for the writing section (part II) of the cycle test. Remind them that this section of the test is worth one third of their test score.

Model planning using a graphic organizer.

**Model a Skill**

Remind students that a first step in the writing process is planning, or prewriting. Model using the writing prompt and writer’s guide to create a prewriting graphic organizer. Point out that planning helps them organize their ideas and makes drafting easier.



**Teamwork** tp

(20 minutes)

Students write for 10 minutes.

**Independent Work**

Tell students that they have 10 minutes to plan and write drafts of their responses to the writing prompt. Remind them to write on every other line to leave room for revisions. Suggest that they refer to the writing prompt to be sure that they include all the required elements and to the writer’s guide to check the quality of their response.

**Team Discussion**

1. Refer students to the peer feedback checklist in their student editions, and review how to get/give feedback.
2. Have students share their drafts in teams. Allow 5 minutes for students to revise their writing projects based on feedback and to edit them using the editing checklist in their student editions.
3. Have teams put their writing projects in a pile in the middle of their tables so a writing project can be randomly selected.

Monitor discussions as partners and teams give feedback.

Students revise and edit their writing projects.



# Class Discussion tp

(30 minutes)

Display and evaluate randomly selected writing projects using the writer's guide.

## Lightning Round

Randomly select a writing project from one or two teams' piles without revealing their authors. Display a writing project, and read it aloud.

Refer students to the writer's guide for Writing to Inform or Explain and the writing objective—using key scientific terms and definitions from the text to explain a process.

Using the writer's guide, discuss and evaluate the selected writing project(s) with the class.

For example, ask:

- **Does the writer introduce the topic clearly?**
- **Does the writer include facts and examples to help a reader understand the information?**
- **Does the writer end with a closing statement that supports the information?**
- **Does the writer use appropriate academic language and full sentences?**

Award points to teams whose writing projects meet the criteria. Record these points on the team poster.

## Reflection on Writing

Have students reflect on their use of the writing process. Ask:

**How did creating and using a graphic organizer work for you? How did it help you write your draft?**

*Answers will vary.*

**What was the most useful feedback that you received? How did it affect your revisions?**

*Answers will vary.*

**Did you find it easy or difficult to include examples in your writing? Do you think the examples were effective?**

*Answers will vary.*

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

### **Celebrate**

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Writing Prompt

Explain how temperature affects snowflakes, glaciers, and icebergs.

Writing to Inform or Explain	
<b>Ideas</b>	<ul style="list-style-type: none"><li>• Clearly introduce the topic.</li><li>• Develop the topic with relevant details.</li></ul>
<b>Organization</b>	<ul style="list-style-type: none"><li>• Begin by introducing the topic.</li><li>• In the middle, provide facts, examples, or events that help a reader understand the information.</li><li>• End with a closing statement that supports the information.</li></ul>
<b>Style</b>	<ul style="list-style-type: none"><li>• Use words and phrases that help a reader understand how the facts or events are related.</li><li>• Include details or examples that help a reader make a mind movie.</li></ul>
<b>Mechanics</b>	<ul style="list-style-type: none"><li>• Use correct punctuation, capitalization, spelling, and grammar.</li></ul>

## Lesson 6

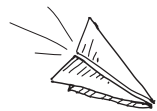
**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

**Writing Objective:** Use key scientific terms and definitions from the text to explain a process.

### Teacher Background

Today’s cycle test challenges students to make connections between two articles. What students learn in one article will enhance their understanding of the other.

For the cycle test, students will read two articles. “The Ice Storm That Stole Christmas” is about a powerful ice storm in New England that occurred in 2008. This article explains how an ice storm forms and the consequences of an ice storm. “Ice Power—It Can Break Steel!” gives another example of the destructive power of ice. Half of the roof on a storage building in Iowa collapsed. The author connects this example to the concept of load, or how much force a building must resist. The author describes the various types of load and the impact it has for engineers.



## Active Instruction tp

(5 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don’t know this word; it’s totally new to me.

Teams review their cycle goal.

Post and present the reading and writing objectives.

Review Vocabulary Vault.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

### Set the Stage

1. Ask students to review their team’s goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and reading and writing objectives.
4. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.



# Prepare Students for the Test tp

(5 minutes)

tps

## Partner Review

1. Remind students that they have been practicing clarifying meanings of words in scientific text and using scientific words to explain processes. Use **Think-Pair-Share** to ask:

**What is a word that you clarified this cycle, and what strategy did you use?**

*(Answers may vary.) I clarified the word calved. The text mentioned a “calved iceberg.” This was in a caption of a picture of a piece of ice that looked broken. The caption said the piece of ice broke off, so I figured that calved meant broken. Using a text feature helped me clarify an unfamiliar word.*

**How did clarifying this word help you understand the text?**

*(Answers may vary.) Clarifying calved helped me understand how the iceberg looked. If I didn’t clarify calved, I wouldn’t have made a connection between that word and the picture of broken ice.*

Tell students that they will use this skill as they take the cycle test.

2. Have partners review their notes and word power journals for this cycle. Allow 2 or 3 minutes for this activity.

## Test Directions

1. Remind students that the test is independent work. Students should not ask their partners for help as they read, but they may use sticky notes if they would like.
2. Distribute the test so students can preview the questions. Point out that some of the test questions are multiple choice for which they will choose the best answer. Other questions require them to write a short answer or create a graphic organizer. Part II of the cycle test requires them to write a long answer. Remind them that their writing project was practice for writing the long answer for part II of the test.
3. Point out that questions #2 and #3 ask about scientific terms.
4. Ask students to identify key words or phrases in question #2.

2. As used in the article “Ice Power,” what does the word *load* mean? Why is it an important factor for anyone designing a building? **[CV, MI]**

5. Introduce the text that students will read. Tell what it is about, but do not give additional information or details.

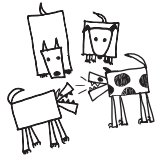
**Today you will read about a powerful ice storm and the destruction that ice can cause.**



## Test tp

(30 minutes)

Tell students that they have 30 minutes for the test and that they may begin. Give students a 5-minute warning before the end of the test.



## Teamwork tp

(10 minutes)

### Team Discussion

1. Pass out a colored pen to each student.
2. Explain or review, if necessary, the student routine for team discussions after the test.
3. Have teams discuss their answers to the test questions. As you monitor team discussions, ask additional questions to prompt their thinking about the important ideas in the reading and about the skills and strategies that they have been using.

Teams discuss the answers to the test questions.



## Class Discussion tp

(10 minutes)

1. Use **Random Reporter** to have teams share team discussions of the test questions and explain their thinking.

Use **Think-Pair-Share** to ask:

**Why do you think “Ice Power” appears after “The Ice Storm That Stole Christmas”?**

*I think “Ice Power” appears second because in “The Ice Storm That Stole Christmas,” there are examples of the damage that ice caused during a New England storm. The article explains that ice fell on homes, cars, and power lines. In “Ice Power,” there is a description of load, and that helped me understand that the destruction in “The Ice Storm That Stole Christmas” happened because the structures that collapsed could not withstand the force of the ice.*

Random Reporters share team discussion of a test question.



**Did you clarify the meaning of any words to help you understand a process?**

*(Answers may vary.) I clarified the meaning of electrical grid to understand what happened when limbs fell on power lines. I know that power lines provide electricity to homes and buildings. In “The Ice Storm That Stole Christmas,” it says that when the limbs fell, it devastated an electrical grid. I know that a grid is a certain area or group of homes or buildings. So when the limbs fell, the power lines didn’t work, and that affected a whole area that needs electricity.*

**Did you see any connections between these articles and what you read earlier in the cycle?**

*(Answers may vary.) Yes. I see a connection between these articles and the article about glaciers. These articles described the damage that an ice storm caused. Ice can cause a lot of destruction. The article about glaciers explained how glaciers can crush houses or ships. Although there are different forms of ice, they can all cause destruction.*

2. Award team celebration points.
3. Collect test answers. Score original answers, and add extra points for improved answers.

**Celebrate**

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.

2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

## Cycle 1 Test

## Clarify Words in Science

**Directions:** Read “The Ice Storm That Stole Christmas” and “Ice Power—It Can Break Steel!,” pages 26–29. Use the TIGRRS process, and answer the following questions on a separate piece of paper.

**Part I. Comprehension** (100 points)

Choose one of the two articles that you read.

## 1. What is the topic?

*5 points = The topic of “The Ice Storm That Stole Christmas” is the effects caused by ice storms. The article describes both short-term and long-term effects.*

What is the author’s intent?

*5 points = The author’s intent is to inform the reader about ice storms.*

Write a short summary of the text. Include the graphic organizer or notes that you used to organize the information and your thoughts. **[MI, AP]**

*10 points = An ice storm is very dangerous and can cause a lot of damage. In an ice storm, rain falls through a cold layer of air. Ice storms may cause more than two inches of icing which results in trees falling due to the weight of the ice. Then, tree limbs may fall on roads or power lines, which results in no electricity. This is a short-term effect. There are long-term effects too, such as brush lining the roads in the spring.*

What is the topic?

*5 points = The topic of “Ice Power” is the powerful weight of ice.*

What is the author’s intent?

*5 points = The author’s intent is to inform the reader about ice’s power.*

Write a short summary of the text. Include the graphic organizer or notes that you used to organize the information and your thoughts. **[MI, AP]**

*10 points = The weight of ice can be powerful enough to destroy something that has held up in the past. The author uses the example of a man who had half of the roof on his storage building collapse due to ice. Therefore, he had to figure out how much weight the structure could support. The name for this is “load,” meaning how much force a roof or building must resist. There are different types of load to consider when designing a structure.*

2. As used in the article “Ice Power,” what does the word *load* mean? Why is it an important factor for anyone designing a building? [CV, MI]

20 points = *The word load in this article refers to the forces that a building must withstand. For example, anyone designing a building where there is a lot of snowfall would have to consider the snow load, or weight of snow on a roof that a building can support without collapsing. Building designers use calculations from the Society of Civil Engineers to determine the average snow load in a certain area so they can design structures strong enough to be safe. Load is an important factor for anyone designing a building.*

15 points = *The word load in this article means the forces that a building must withstand. Anyone designing a building where there is a lot of snowfall would have to think about the snow load on a roof that a building can support without collapsing. Building designers use calculations from the Society of Civil Engineers to figure out the average snow load in a certain area.*

10 points = *It means the forces that a building must withstand. Anyone designing a building where there is a lot of snowfall would have to think about the snow load on a roof.*

3. How does understanding the meaning of *load* help you understand events in “The Ice Storm That Stole Christmas”? What is the connection? [CV, RE]

20 points = *The ice load was the cause of problems in New England in 2008. An ice storm coated everything with ice. The weight of the ice caused trees and telephone poles carrying power lines to snap because they could not withstand the ice load. Understanding that load is how much weight something can resist or handle helped me understand the effects of an ice storm.*

15 points = *The ice load was why there were problems in New England in 2008. An ice storm coated everything with ice. The weight of the ice is why telephone poles snapped.*

10 points = *The ice load was why there were problems in New England in 2008.*

4. What was the problem for residents in disposing of fallen branches after the ice storm? [DC]

20 points = *The problem for residents was that they were not allowed to get rid of the fallen branches. There was an infestation of Asian long-horned beetles. These beetles laid their eggs in the branches of the debris, and cutting up the branches or moving them would spread the beetles’ eggs. To avoid more infestation, the debris had to be moved by professionals.*

15 points = *The problem for residents was that they were not allowed to get rid of the fallen branches. Beetles laid their eggs in the branches, and cutting up the branches or moving them would spread the beetles’ eggs.*

10 points = *The problem for residents was that they were not allowed to get rid of the fallen branches.*

5. Are all types of load the same? Explain. **[DC, SA]**

20 points = *No, all types of load are not the same. Load **refers to** the force that a roof or building must resist. However, dead load includes the actual weight of a structure itself. Live load is the weight of people and objects moved on or off the structure. There are also snow load, wind load, and seismic load. These types of load are **especially** important to **consider** in areas where natural disasters such as earthquakes might happen. The different types of load **affect** how engineers design safe buildings.*

15 points = *No, all types of load are not the same. Dead load includes the actual weight of a structure itself. Live load is the weight of people and objects moved on or off the structure. There is also snow load, wind load, and seismic load.*

10 points = *No. There are dead load and live load.*

**Part II. Writing** (100 points)

Write at least one paragraph to answer the following question:

Use information from “The Ice Storm That Stole Christmas” and “Ice Power” to explain how an ice storm forms and its results. Be sure to include scientific terms that you have learned, but explain what they mean in your own words.

*For an ice storm to form, there must be unusual weather. For ice to form on branches and objects, rain has to fall from the upper cloud layer through warm air way above the ground until it finally falls through a freezing layer over the ground. This freezing layer has to be cold enough to cause everything on the ground to be at freezing temperature, but not actually freeze the falling rain. When these conditions happen, rain droplets freeze when they come in contact with anything outside.*

*After an ice storm, trees and limbs fall because of the weight of ice on them. When limbs fall on power lines, people are without power. After the 2008 ice storm in New England, it took more than two weeks to restore power. In Iowa, half of the roof on a storage building collapsed due to the weight of the ice. The owner had to repair it and take into consideration the load that it should be built for. Load means how much force a building must resist. His new roof has a snow load per square foot that is more than twice the load of his old roof. It is clear from reading these articles that ice storms are very powerful and leave their mark.*

The following guide is used to score part II of the cycle test.

Writing to Inform or Explain		
<b>Ideas</b>	<ul style="list-style-type: none"> <li>Clearly introduces the topic</li> <li>Develops the topic with relevant details</li> </ul>	<b>0–25 pts.</b>
<b>Organization</b>	<ul style="list-style-type: none"> <li>Begins by introducing the topic</li> <li>In the middle, provides facts, examples, or events that help a reader understand the information</li> <li>Ends with a closing statement that supports the information</li> </ul>	<b>0–25 pts.</b>
<b>Style</b>	<ul style="list-style-type: none"> <li>Uses words and phrases that help a reader understand how the facts or events are related</li> <li>Includes details or examples that help a reader make a mind movie</li> </ul>	<b>0–25 pts.</b>
<b>Mechanics</b>	<ul style="list-style-type: none"> <li>Uses correct punctuation, capitalization, spelling, and grammar</li> </ul>	<b>0–10 pts.</b>
<b>Writing Objective</b>	<ul style="list-style-type: none"> <li>Use key scientific terms and definitions from the text to explain a process.</li> </ul>	<b>0–15 pts.</b>

**Part III. Vocabulary** (100 points)

1. Which of the following is an example of something that could not be crystallized? Explain why. **[CV]**

- A. *pizza*
- B. salt
- C. minerals
- D. snowflakes

*Pizza could not be crystallized because it is not made of crystals.*

2. Write a meaningful sentence using the word *minuscule*. **[CV]**

*Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: Kayla was upset that she only had a minuscule amount of blue paint left since she still had to create the sky in her painting.*

3. Since the mountains looked like \_\_\_\_\_ even far away, Stacey changed her mind about climbing them.

Choose the word that belongs in the blank. **[CV]**

- A. *behemoths*
- B. correlation
- C. symmetry
- D. hexagon

4. A long-standing scientific debate is whether there is a \_\_\_\_\_ between brain size and intelligence. **[CV]**

Choose the word that belongs in the blank.

- A. hexagon
- B. symmetry
- C. geothermal
- D. *correlation*

5. Write a meaningful sentence using the word *hexagon*. **[CV]**

*Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: Cheri counted six sides on the tile, which reminded her of a hexagon.*

6. Darius \_\_\_\_\_ that if he gave his plants more water, they would grow faster.

Choose the word that belongs in the blank. **[CV]**

- A. crystallized
- B. geothermal
- C. *hypothesized*
- D. symmetry

7. Which of the following is an example of a place that would not use geothermal energy? **[CV]**

- A. greenhouse
- B. swimming pool
- C. office
- D. *frozen food aisle*

8. Write a meaningful sentence using the word *symmetry*. **[CV]**

*Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: Judy carefully sliced the pie so it would appear to have perfect symmetry.*

9. What is one word that you or your teammates explored in your word power journal this cycle? Give the meaning of this word, and then use it in a meaningful sentence. **[CV]**

*A word that we explored was deduced. It was used on page 13 in the sentence that begins "...Na Kaya first deduced through pain-staking work in Sapporo, Japan, that different..." Deduced means figured out. The result of his work is stated later in the sentence. A meaningful sentence is "Jennie deduced that leaving early to get to work on time was best since there was a bad traffic jam."*

10. As used on page 35 in the sentence “It’s critical to keep the sprinkler head rotating and dispersing water on the cranberry vines,” *dispersing* most nearly means— **[CV]**

- A. collecting quickly.
- B. *spreading widely.*
- C. pulling hard.
- D. moving slowly.

Explain how you figured out the meaning of *dispersing*.

*Students will explain their thinking. For example: I used the context. The sentence says the sprinkler is rotating, or turning around and around. Since the sprinkler is rotating, the water is probably spreading out all over the cranberry vines.*

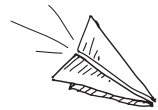
Question Codes			
<b>[DC]</b>	Make inferences; interpret data; draw conclusions.	<b>[AA]</b>	Analyze an argument.
<b>[SA]</b>	Support an answer; cite supporting evidence.	<b>[AP]</b>	Identify author’s intent or purpose.
<b>[MI]</b>	Identify the main idea that is stated or implied.	<b>[RE]</b>	Analyze relationships (ideas, story elements, text structures).
<b>[CV]</b>	Clarify vocabulary.	<b>[AC]</b>	Author’s craft; literary devices

## Lesson 7

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

### Teacher Background

During Class Discussion, students orally present evaluations of their homework reading selections. During Teamwork, students use their Read and Respond notes and answers to the homework questions to make final preparations for these presentations. Team members share their responses and give one another feedback. During the oral presentations, students use their revised responses to the questions to describe the kind of texts they read, the strategies that helped them understand the text, and whether they will recommend their reading selections to others.



## Active Instruction

(20 minutes)

### Two-Minute Edit

1. Display and have students complete the Two-Minute Edit as they arrive for class.
2. Use **Random Reporter** to check corrections. Award team celebration points.

### Vocabulary

Ask teams if they have a Vocabulary Vault word that they would like to share. Award team celebration points.

### Set the Stage

1. Ask students to review their team's goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Have students get out their reading selections and Read and Respond forms. Remind them that today, with the help of their teams, they will each prepare a presentation about their individual reading selections.

Challenge students to think about the strategies and skills that they used to read their self-selected texts, share their answers to the Read and Respond questions, discuss their thinking, and prepare evaluations of their selections.

4. Remind students to add to the notes on their Read and Respond forms as they discuss their selections and prepare oral presentations about their selections. Students will use their answers to the questions on the Read and Respond form as the basis for their presentations.

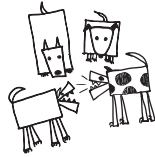
Two-Minute Edit



Vocabulary Vault

Teams review their cycle goal.

Connect the cycle objective to students' homework reading selections.



# Teamwork tp

(25 minutes)

## Team Discussion

1. Tell students that they will use the Read and Respond questions as a guide as they discuss their homework reading and prepare evaluations of their reading selections to share with their teams.
2. As students prepare their answers, check in with those students for whom you do not have individual scores for graphic organizer/notes, written Team Talk responses, word power journal, and/or a fluency score. Have them show you examples from the cycle. Point out areas of success, and give feedback to improve student performance.
3. As you visit teams, take this opportunity to check students' homework for completion (Read and Respond forms). Enter the information on your teacher cycle record form.

### Teacher's Note:

Have students who are ready for a new selection take turns choosing reading material from the classroom library. Make sure that every student has a Read and Respond form for next cycle.

Students prepare, share, and revise presentations about their reading selections.

Give students feedback on classwork.

## Read and Respond Questions

<b>1.</b>	Is your selection informational or literature? Summarize your reading. (summary rubric)
<b>2.</b>	Why did you choose this reading? What is your purpose for reading? (Team Talk rubric)
<b>3.</b>	Choose a word, phrase, or passage that you did not understand at first. How did you figure it out? (strategy-use rubric)
<b>4.</b>	Write down a question that you had or a prediction that you made as you read. Were you able to answer or confirm it? Explain. (strategy-use rubric)
<b>5.</b>	Would you recommend this selection to others to read? State your opinion, and support it with reasons. (Team Talk rubric)
<b>6.</b>	Choose a short section of the text that you think is important or especially interesting. Tell your teammates why you chose it. Read it aloud smoothly and with expression. (fluency rubric)



# Class Discussion tp

(15 minutes)

Team responses  
and feedback



Teams report on  
their review of the texts  
and Read and Respond  
discussions.

Celebrate team successes!

Final tally for this cycle

Record team celebration  
points on the teacher cycle  
record form.

Collect Read and Respond  
forms for this cycle.

## Lightning Round

Use **Random Reporter** to have students present their evaluations of their homework reading selections (responses to the Read and Respond questions). Use rubrics to evaluate responses, give specific feedback, and award points.

## Celebrate

1. Tally up this cycle's points on the poster.
2. Tell students that their scored tests will be returned at the beginning of the next lesson. Poster points and the teams' test scores will determine which teams earn the status of super team, great team, or good team for the cycle.
3. Be sure to record each team's total celebration points from the poster into the teacher cycle record form. Remind students that team celebration points and team test averages are used to determine team scores.
4. Collect students' Read and Respond forms, and pass out new forms.
5. Tally up the number of Read and Respond signatures on students' forms, and record the number on the teacher cycle record form after class.

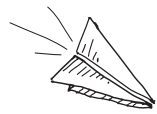
# Lesson 8

**Objectives:** Celebrate successes and set new goals. Hold a Class Council meeting.

## Teacher Background

In the first part of this lesson, students review their test results and their final scores for the cycle and compare them with their goals. They celebrate success and set new goals for further improvement.

In the second part of the lesson, students participate in Class Council.



## Active Instruction

(2 minutes)

### Two-Minute Edit

1. Display and have students complete the Two-Minute Edit as they arrive for class.
2. Use **Random Reporter** to check corrections. Award team celebration points.



## Celebrate/Set Goals

(20 minutes)

1. Distribute students' scored cycle tests. Allow a few moments for students to review them.
2. Distribute team score sheets to teams and celebration certificates to students. Remind students that the cycle's top-scoring teams are determined by their points on the poster and their test scores.
3. Recognize and celebrate the super, great, and good teams. Remind the teams of the impact of bonus points that are added to team members' cycle scores.
4. Have each team discuss and set a goal for the next cycle and record it on their team score sheet. Use the questions below to analyze and discuss the students' scores.

**What was your team's highest score?**

**What score do you want to improve?**

**What can the team do to improve that score?**

Two-Minute Edit



Distribute scored cycle tests.

Distribute team score sheets and celebration certificates.

Class celebration! Celebrate team successes with a class cheer.

Each team sets a team goal for the next cycle.



Use **Random Reporter** to ask:

**What is your team's goal for the next cycle? Why did you choose that goal?**

*Accept supported answers.*

5. Use the poster to award team celebration points for responses that include the team's reasons for choosing the goal, thus beginning the accumulation of points for the next cycle.
6. Have students record their cycle test scores and their areas of greatest strength and improvement on their progress charts.



## Class Council

(30 minutes)

1. Share class compliments.
2. Review the class goal that was set at the last Class Council. Using the agreed-upon measure of progress, was the goal met? Why or why not?
3. Discuss a class concern, or use the scenario and discussion hints provided.
4. Have teams discuss and then use **Random Reporter** to share responses.
5. After debriefing how they resolved the problem, help students set a goal and a measure of progress that they can use at the next Class Council.



## Brain Game

(5 minutes)

1. Choose a brain game from the card set, and then play the game.
2. Use the following questions to debrief and remind students of self-regulatory strategies:

**What did this game require your brain to do?**

**How will use of this skill improve your success in other classes?**



## Cycle 2:

Clarify  
Words in  
Science

## Lesson 1

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

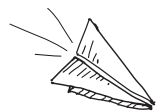
**Teacher Background**

The article for this lesson, “This Is Your Brain on Ice,” is about the role of an ice machine in heart surgery. Dr. John Eleftheriades in Connecticut frequently performs heart surgeries in which patients are clinically dead. However, the bypass machine that he uses is filled with ice, which slows down cell death. Once the ice is removed, the patient is warmed up and his or her heart begins beating again. A sidebar in the article explains the importance of ice in medicine throughout history.

The Big Question for this cycle will encourage students to think about whether all ice is the same and whether there is only one use for ice or a variety of uses. Some students might not have heard of ice being used in medical procedures. On the other hand, students who are athletes might be familiar with ice being used for an injury such as a sprain. When building background about the topic, share the following facts about ice being used in medicine:

- Ice was used by ancient Greeks and Romans for medical purposes.
- In 1850, a Florida doctor patented the first commercial ice machine that made ice and air-conditioned rooms for malaria patients.
- Using ice to heal sports injuries is called cryotherapy.

Source: Knight, Kenneth L. (1995). *Cryotherapy in Sport Injury Management*. Champaign, IL: Human Kinetics.

**Active Instruction** tp

(22 minutes)

**Big Question**

Post and present this cycle’s Big Question. Have students write a response to the question as they arrive for class.

**The Big Question:** Is all ice the same? Does ice have one use or many uses?

**Set the Stage** tp

1. Refer students to today’s Big Question. Use **Think-Pair-Share** to ask:

**Is all ice the same? Does ice have one use or many uses?**

*(Answers may vary.) No, all ice is not the same. For example, there is dry ice. There is ice that forms outside after a snowfall. There is also ice that you can skate on at an indoor skating rink. There are glaciers, which are huge pieces of ice. There are icebergs, or ice broken off from a glacier. Ice has many*

Students write responses to the Big Question.

Discuss the Big Question.



Teams review their cycle goal.

Post and present the reading objective.



Build background about ice in medicine.

**Teacher:** Read aloud.  
**Students:** Practice the skill or strategy.



*uses. If you sprain or twist your ankle, you should put ice on it. Ice brings the swelling down. You can put ice in a drink to make it really cold. You can use an ice pack to keep your lunch cold if you can't refrigerate it.*

2. Ask students to review their cycle goal. Remind students how to earn team celebration points. Remind them that team celebration points help them become super teams. Tell them that they can earn team celebration points during the Lightning Round.
3. Introduce the texts, authors, and reading objective.
4. Have teams discuss and report on their preview of the text and explain their thinking. Use **Random Reporter** to share team responses.

**T:** How ice is used in surgery. There is a picture of a heart with a lot of blood, doctor's scrubs and gloves, and a bucket with what looks like ice water.

**I:** To inform the reader about why or how ice is used during surgery.

**G:** A web because there will probably be details about the use of ice.

5. **Remember that the Big Question asked if there was only one use for ice or several uses. Today we will read about how ice is used in heart surgery. Ice has played an important role in medicine since ancient times.**

You may wish to share the following facts with your students:

- Ice was used by ancient Greeks and Romans for medical purposes.
- In 1850, a Florida doctor patented the first commercial ice machine that made ice and air-conditioned rooms for malaria patients.
- Using ice to heal sports injuries is called cryotherapy.

### Interactive Read Aloud

1. Refer to the reading objective, and review the skill if necessary.
2. Read pages 37 and 38 (stopping at "Ice to the Rescue") aloud. Use **Think-Pair-Share** to prompt use of the skill or strategy.

#### What did you need to clarify as I read? How did you clarify it?

*(Answers may vary.) I needed to clarify aortic arch. I've never heard this term before, and it was a little confusing. It says the aorta is a main artery. I kind of know what an artery is; I've heard of arteries being clogged. This artery carries blood. The name is aortic arch because it forms a handle at the top of the heart. The aortic arch is where the artery connects to the heart. This was hard to picture, so I thought of where I've heard the word arch and remembered that it's like a curve.*

#### How did clarifying this term help you understand the text?

*(Answers may vary.) Clarifying aortic arch helped me understand what the doctor is operating on. It is hard to understand without thinking about what this means and what the aortic arch might look like.*

**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.

3. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read paragraphs 1–3 of “Ice to the Rescue.” Use **Think-Pair-Share** to ask:

**What strategies did you use to clarify the word *hibernating*, and how did this help you?**

*(Answers may vary.) I clarified hibernating by using context clues and prior knowledge. I know that bears hibernate in the winter. This means they go into a cave and don't come out until it is warmer. They're not active when they hibernate. In the article, it says "the patient isn't so much dead as hibernating." So even though the machine is turned off, the patient isn't dead. He or she is alive but not at all active. Using prior knowledge about bears hibernating and clues in the article helped me understand what happens to the patient.*

**What happens as the patient is hibernating?**

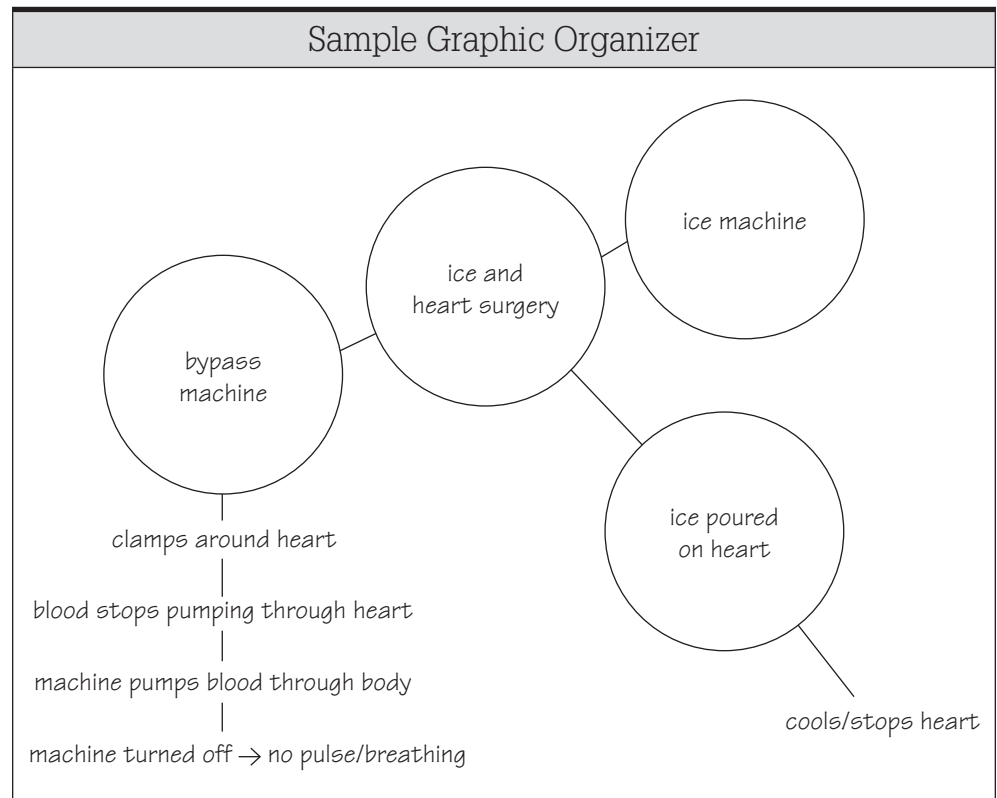
*As the patient is hibernating, bags of ice are adjusted around his or her head. After thirty minutes, the weakest tissue is cut away. A patch is put in its place and should last for the rest of his or her life.*

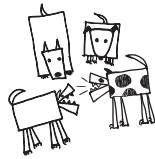
4. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

A sample graphic organizer follows.

**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.





# Teamwork tp

(20 minutes)

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

## Partner Prep

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: sr  
**page 39 (starting at “Now it’s time...” and including sidebar) aloud with partners.**
2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

## Team Discussion

Cue students to use their student routines for strategy use and Team Talk discussion.

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. sr
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team’s strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team’s graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students’ reflection as they determine the meaning of the “(Write)” question.

Team Talk Questions
<p>1. Why is ice used in heart surgery? <b>(Write) [CV, MI]</b> (Team Talk rubric)</p> <p style="margin-left: 20px;"><i>100 = Ice is used in heart surgery because it <b>reduces</b> body temperature and protects brain cells. When a bypass machine is turned off during the surgery, blood doesn’t flow to the brain, so brain cells would die. But when cells are cooled down with ice, they don’t die as quickly. After surgery, the body is slowly warmed up, the heart starts pumping blood again, and brain cells are not <b>damaged</b>. It is important that ice is used in heart surgery because it <b>prevents</b> body temperature from rising and protects brain cells.</i></p> <p style="margin-left: 20px;"><i>90 = Ice is used in heart surgery because it lowers body temperature and protects brain cells. When a bypass machine is turned off, blood doesn’t flow to the brain, so brain cells would die. When cells are cooled down, they don’t die as quickly.</i></p> <p style="margin-left: 20px;"><i>80 = It lowers body temperature and protects brain cells.</i></p>

*continued*

Team Talk Questions *continued*

2. Why does the author mention eggs hitting a hot frying pan? **[AP, DC, SA]**  
(Team Talk rubric)

*100 = The author mentions eggs hitting a hot frying pan to make a **comparison** to explain why a patient shouldn't be warmed up too fast. Dr. Elefteriades **explains** that after the weak aortic tissue is gone and replaced with a fabric patch, the patient is ready to be warmed up. **However**, he says that this shouldn't be done too fast because a protein in blood becomes solid when heated quickly, like an egg when it hits the pan and starts cooking. The example of eggs hitting a frying pan helps me understand why a patient shouldn't be warmed up too quickly.*

*90 = The author mentions eggs hitting a hot frying pan to show why a patient shouldn't be warmed up too fast. Dr. Elefteriades says that after the weak aortic tissue is gone, the patient is ready to be warmed up. He says that this shouldn't be done too fast. A protein in blood becomes solid when heated quickly, like eggs hitting a hot frying pan.*

*80 = She mentions this to show why a patient shouldn't be warmed up too fast.*

3. As used on page 39 in the sentence "I'm in awe," awe most nearly means—  
**[CV, DC, SA]** (strategy-use rubric)

- A. a state of horror.
- B. a state of sadness.
- C. a state of amazement.
- D. a state of happiness.

Explain how knowing the meaning of awe helps you understand Dr. Elefteriades' feelings about the heart surgeries that he performs.

*100 = Knowing the meaning of awe helps me understand that Dr. Elefteriades is amazed by the surgeries that he performs. Although he performs them often, he feels amazed by the operation and doesn't quite understand how it works. Understanding awe tells me that even though the surgeries are successful, they still don't make sense, even to a doctor.*

*90 = Knowing the meaning of awe helps me understand that Dr. Elefteriades is amazed by the surgeries that he performs. He performs them a lot, but he doesn't quite understand how it works.*

*80 = Dr. Elefteriades is amazed by the surgeries that he performs.*

*continued*

Team Talk Questions *continued*

4. Why do you think the author included the sidebar on page 39? [AP, DC, SA] (Team Talk rubric)

100 = *I think the author included the sidebar because it shows that **throughout history**, ice has been important in medicine. Ice can **reduce pain** and **slow bleeding**. **Even** in the 4th century BCE, wounded soldiers were packed in ice. Today patients are cooled down to **prevent brain damage** caused by different conditions. **Although** ice has been used for centuries, as described in the examples given, it is still not clear why it works so well.*

90 = *I think the author included the sidebar because it shows that ice has always been important. In the 4th century BCE, wounded soldiers were packed in ice. Today patients are cooled down so there is no brain damage.*

80 = *It shows that ice has always been important.*

Cue students to discuss strategy use, graphic organizers, and word power journals.

4. Have students thoroughly discuss Team Talk questions before they write individual answers to the skill question marked “(Write).” Allow students to revise their written answers after further discussion if necessary.
5. Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.
6. Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
7. If some teams finish ahead of others, have them practice their fluency.
8. Award team celebration points for good team discussions that demonstrate 100-point responses.

Randomly select team representatives who will share:



- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection



## Class Discussion tp

(18 minutes)

### Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

### **Celebrate**

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

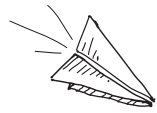
- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Lesson 2

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

### Teacher Background

In today’s reading, students will read three brief articles in the “Science Scoops” section. In “Asteroid Special Delivery,” they will learn about asteroids containing water and the search for water on 24 Themis, the largest asteroid between Jupiter and Mars. In “It’s an Icequake,” students will learn what scientists determined as a result of monitoring Antarctic tremors in the early 2000s. They will also learn what scientists know about icequakes. “Moons Born from Speeding Ice” describes how Saturn’s rings form and how that relates to the solar system’s formation.



## Active Instruction tp

(25 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don’t know this word; it’s totally new to me.

Teams discuss their vocabulary ratings.



Introduce vocabulary.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they copy the words in their word power journals and rate their knowledge of each as they arrive for class.
2. Spot check the Read and Respond homework.

### Vocabulary

1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a “+” and a word the entire team rated with a “?”.
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Award team celebration points.
3. Introduce the vocabulary for this cycle. Read each word aloud, and model chunking as needed. Then read the meaning of each word.

Word	Pronunciation	Definition	Sample Sentence
<b>gravitational</b> (adjective) page 5	grav-i-ta-tion-al (grav-i-TEY-shuhn-uh)	related to the force of attraction between two things	Earth has a strong <i>gravitational</i> pull on the moon.
<b>apocalyptic</b> (adjective) page 7	a-poc-a-lyp-tic (uh-pok-uh-LIP-tik)	predicting disaster or destruction	“Your views of the future are <i>apocalyptic</i> and very negative,” Mr. Hanson said.

*continued*

Word	Pronunciation	Definition	Sample Sentence
<b>peculiar</b> (adjective) page 7	pe-cu-liar (pi-KYOOL-yer)	strange; odd	"I've never seen anyone put carrots on ice cream before; that's really <i>peculiar</i> ," Elena told her brother.
<b>ambient</b> (adjective) page 8	am-bi-ent (AM-bee-uhnt)	surrounding	For comfort, the <i>ambient</i> temperature should be below 72°F.
<b>amorphous</b> (adjective) page 9	a-mor-phous (uh-MAWR-fuhs)	not having specific shape	Shawn changed the <i>amorphous</i> lump of clay into a beautiful sculpture.
<b>latent</b> (adjective) page 34	la-tent (LEYT-nt)	present but not seen or presented	Lorraine had a <i>latent</i> talent for drawing that her parents didn't know about.
<b>prone</b> (adjective) page 35	prone (prohn)	being likely	Jessa was <i>prone</i> to getting car sick so she avoided long car trips.
<b>clinically</b> (adverb) page 38	clin-i-cal-ly (KLIN-ik-lee)	based on observation	Dr. Lang's diet program was <i>clinically</i> tested.

Review Vocabulary Vault.

- Use **Random Reporter** to have teams share a new sentence that uses one of their vocabulary words. Award team celebration points.
- Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

**Set the Stage**

- Ask students to review their team's goal for this cycle and assess their progress.
- Review the Team Celebration Points poster, and challenge teams to build on their successes.
- Remind students of the texts, authors, and reading objective.
- Have teams discuss and report on their preview of the text and explain their thinking. Use **Random Reporter** to share team responses.

- T:** Asteroids
- I:** To inform about asteroids
- G:** A web or an outline

Teams review their cycle goal.

Post and present the reading objective.



Build background about the topic.

5. To generate interest in the article you will read aloud, build background about the relationship between ice and outer space. You could share the following facts:

- There could be ice volcanoes in outer space: Charon, an object that is Pluto's neighbor, may have liquid water coming from volcanoes and covering Charon's surface with ice crystals.
- Scientists are drilling holes in Antarctic ice to catch neutrinos. Neutrinos are particles from space that help astronomers learn about stars and black holes.
- Jupiter and Saturn have many large icy moons.

Sources: "Ice volcanoes in outer space?" [www.nature.com/news/2007/070716/full/news070716-9.html](http://www.nature.com/news/2007/070716/full/news070716-9.html)

[www.kidsastronomy.com/jupiter.htm](http://www.kidsastronomy.com/jupiter.htm)

[www.kidsastronomy.com/saturn.htm](http://www.kidsastronomy.com/saturn.htm)

### Interactive Read Aloud

1. Read page 4, "Asteroid Special Delivery," aloud. Use **Think-Pair-Share** to prompt use of the skill or strategy. Use **Think-Pair-Share** to ask:

**Why was it important to clarify the term "organic compounds"? If the term hadn't been defined in a text feature, could you still have figured out the meaning? Explain.**

*It was important to clarify the term "organic compounds" because otherwise we don't know what asteroids contain. Understanding that an organic compound is a substance with carbon in living things makes the idea of an asteroid clearer. I could have figured out the meaning because I know that compound means two things that are joined. This lets me know that organic compounds have more than one substance.*

**Why were scientists surprised to find water ice on 24 Themis?**

*Scientists were surprised because most asteroids are so close to the sun that it doesn't seem possible for them to hold onto ice without it evaporating. The location of most asteroids makes it hard to believe that ice could exist on one.*

2. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read "It's an Icequake!"

Use **Think-Pair-Share** to ask:

**What does the word *calve* help you understand about glaciers?**

*The word calve helps me understand that glaciers do not always stay in one piece. Pieces of glaciers break off into the sea, although it is unclear why this happens.*

**Teacher:** Read aloud.

**Students:** Practice the skill or strategy.



**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.



**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.

### What does “tidal movement” mean? Why is this term important?

*“Tidal movement” means that when the tide comes, the glacier that gets stuck against a rough piece of rock, unable to move, suddenly becomes free and moves forward. This term is important because it explains the cause of an icequake.*

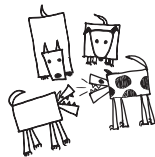
Use **Random Reporter** to debrief.

3. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

A sample graphic organizer follows.

Sample Graphic Organizer	
I.	Ice and unusual happenings
A.	Asteroids
1.	Surprising to find water there
2.	Searched 24 Themis
a.	Between Jupiter and Mars
B.	Icequakes
1.	Glaciers pop/creak
2.	Twice a day
3.	Wouldn't feel anything standing on glacier



## Teamwork tp

(20 minutes)

### Partner Prep

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: **Sr**  
**page 5 (“Moons Born from Speeding Ice”) aloud with partners.**
2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

Cue students to use their student routines for strategy use and Team Talk discussion.

**Team Discussion**

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. **Sf**
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team’s strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team’s graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students’ reflection as they determine the meaning of the “(Write)” question.

Team Talk Questions
<p>1. On page 5, the author writes, “This is the first time anyone has watched moons being born. Do you think the millions of potential moons should get names?” The word <i>potential</i> most nearly means— <b>[CV]</b></p> <ul style="list-style-type: none"> <li>A. <i>possible.</i></li> <li>B. <i>empty.</i></li> <li>C. <i>strange.</i></li> <li>D. <i>dark.</i></li> </ul> <p>Explain how you figured out the meaning of <i>potential</i>.</p> <p>100 = <i>I used clues in the text and my background knowledge to figure out the word potential. I have also heard the word used to describe an athlete who has the potential or possibility to become a superstar. The baby moons are being born and they have the possibility or potential of becoming real moons. That is why the author asks about whether these millions of baby moons deserve names.</i></p> <p>90 = <i>I have also heard the word used to describe an athlete who has the potential or possibility to become a superstar.</i></p> <p>80 = <i>I used clues in the text and my background knowledge to figure out the word potential.</i></p> <p>2. What is the main point the author tries to get across in “Moons Born from Speeding Ice”? <b>[MI, DC, AP]</b> (Team Talk rubric)</p> <p>100 = <i>The main point in “Moons Born from Speeding Ice” is that Saturn’s rings are important to scientists for a <b>variety</b> of reasons. <b>First</b>, the rings <b>provide</b> information about how the solar system formed. <b>Second</b>, baby moons are born in the rings. This is <b>similar</b> to what happened when planets formed. <b>Finally</b>, this is an <b>opportunity</b> for scientists to track disk-embedded objects. This has never been done before. <b>Aside from</b> being interesting to look at, Saturn’s rings will help scientists learn.</i></p> <p>90 = <i>The main point in “Moons Born from Speeding Ice” is that Saturn’s rings are important to scientists for a lot of reasons. The rings give information about how the solar system formed. Baby moons are born in the rings. This is like what happened when planets formed.</i></p> <p>80 = <i>Saturn’s rings are important to scientists for a lot of reasons.</i></p>

*continued*

Team Talk Questions *continued*

3. Explain the role of ice in the birth of Saturn's "baby moons." **(Write) [CV, RE]**  
(Team Talk rubric)

*100 = Ice creates snowballs that result in baby moons. Saturn's outer ring consists of orbiting chunks of ice. Saturn's moons orbit in an inside ring. When the moons pass by, their gravity pushes the ice chunks in the outer ring around, and they clump together in bigger and bigger snowballs. If the bigger snowballs stay stable and are not pulled apart, they can become baby moons or moonlets. Ice is an important factor in the creation of Saturn's baby moons.*

*90 = Ice helps make snowballs that lead to baby moons. Saturn's outer ring has orbiting chunks of ice. Saturn's moons orbit in an inside ring. When the moons pass by, their gravity pushes the ice chunks in the outer ring around. They clump together in snowballs. If the bigger snowballs aren't pulled apart, they can become baby moons.*

*80 = Ice helps make snowballs that lead to baby moons.*

4. Which of the following examples would be amorphous? Explain why. **[CV]**
- A. a cracker
  - B. a globe
  - C. a stop sign
  - D. cake batter

*Cake batter would be amorphous because it does not have a shape. However, once the batter is baked, it becomes a cake. The other examples have shapes, so they are not amorphous.*

4. Have students thoroughly discuss Team Talk questions before they write individual answers to the skill question marked "(Write)." Allow students to revise their written answers after further discussion if necessary.
5. Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.
6. Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
7. If some teams finish ahead of others, have them practice their fluency.
8. Award team celebration points for good team discussions that demonstrate 100-point responses.

Cue students to discuss strategy use, graphic organizers, and word power journals.

Randomly select team representatives who will share:



- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.



# Class Discussion

(15 minutes)

## Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.

## Celebrate

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

Word	Pronunciation	Definition	Sample Sentence
<b>gravitational</b> (adjective) page 5	grav-i-ta-tion-al (grav-i-TEY-shuhn-uhl)	related to the force of attraction between two things	Earth has a strong <i>gravitational</i> pull on the moon.
<b>apocalyptic</b> (adjective) page 7	a-poc-a-lyp-tic (uh-pok-uh-LIP-tik)	predicting disaster or destruction	"Your views of the future are <i>apocalyptic</i> and very negative," Mr. Hanson said.
<b>peculiar</b> (adjective) page 7	pe-cu-liar (pi-KYOOL-yer)	strange; odd	"I've never seen anyone put carrots on ice cream before; that's really <i>peculiar</i> ," Elena told her brother.
<b>ambient</b> (adjective) page 8	am-bi-ent (AM-bee-uhnt)	surrounding	For comfort, the <i>ambient</i> temperature should be below 72°F.
<b>amorphous</b> (adjective) page 9	a-mor-phous (uh-MAWR-fuhs)	not having specific shape	Shawn changed the <i>amorphous</i> lump of clay into a beautiful sculpture.
<b>latent</b> (adjective) page 34	la-tent (LEYT-nt)	present but not seen or presented	Lorraine had a <i>latent</i> talent for drawing that her parents didn't know about.
<b>prone</b> (adjective) page 35	prone (prohn)	being likely	Jessa was <i>prone</i> to getting car sick so she avoided long car trips.
<b>clinically</b> (adverb) page 38	clin-i-cal-ly (KLIN-ik-lee)	based on observation	Dr. Lang's diet program was <i>clinically</i> tested.

## Lesson 3

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

### Teacher Background

“The Truth About Ice-Nine” is about Ice 1h, the ice on Earth. Ice 1h floats, and the article explains the importance of this quality. If Ice 1h sank every winter, the sun could not melt it completely. Consequently, liquid water would not exist on Earth. Life that depends on liquid water would also not be able to exist on Earth if this happened.

Today students will read the first half of this article, which focuses on the characteristics of Ice 1h and where this form may be found. Its most important characteristic is that it floats, which has a huge effect on our planet.

### Teacher’s Note:

Use the Interactive Read Aloud if your students need additional support. Otherwise, build background, and then go directly to teamwork. Adjust partner reading page numbers accordingly.

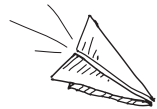
Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don’t know this word; it’s totally new to me.

Teams discuss their vocabulary ratings.



Model exploring a word in the word power journal.



## Active Instruction

(15–25 minutes)

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

### Vocabulary

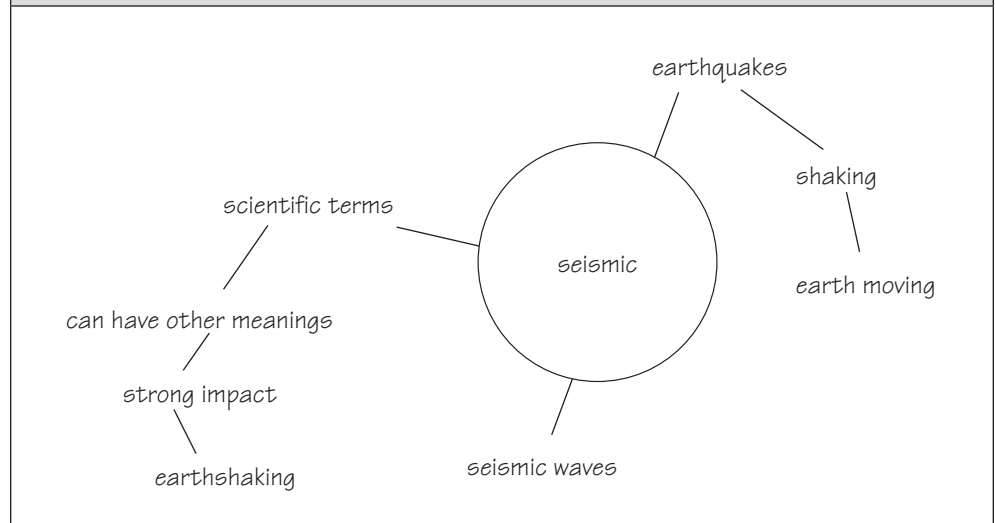
1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a “+” and a word the entire team rated with a “?”.
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Use **Random Reporter** to have teams report on a new sentence using a vocabulary word. Award team celebration points.
3. Choose an important word from the text or class discussion, and model how to explore it in a word power journal entry. A sample Think Aloud and word map follow.

### Sample Think Aloud

A word that I wasn't sure about in the article we read in our last lesson was *seismic*. It was used in the sentence "...they measured an average of one seismic event every 30 seconds!" This came from the section about icequakes. I've heard the word *seismic* before, but usually it's used to talk about earthquakes. Well, the section didn't mention earthquakes. Everything we're reading has to do with ice. It says pops and creaks are occurring. I think that *seismic* has to do with some kind of movement. Maybe a seismic event is an event that causes movement.

Now that I have some ideas, I want to check the dictionary and see if I'm on the right path. (Model looking up the word *seismic* in a dictionary.) OK, the dictionary has two meanings. The first definition says it means caused by an earthquake—but it also says relating to an earth vibration caused by something else. The next definition is having a strong impact: earthshaking. It seems like relating to an earth vibration is the best definition for the way *seismic* is used in the article. So the seismic event that the article talked about wasn't an earthquake, but some sort of vibration. This makes sense. Earlier in the article, it talked about ice shaking.

### Sample Word Map



Review Vocabulary Vault.

4. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

#### Set the Stage

1. Ask students to review their team's goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and reading objective.

Teams review their cycle goal.

Post and present the reading objective.



4. Have teams discuss and report on their preview of the text and explain their thinking. Use **Random Reporter** to share team responses.

**T:** Ice-nine, a dangerous form of ice

**I:** To inform the reader about ice-nine and where to find it

**G:** A web

### Interactive Read Aloud

**Teacher:** Read aloud.  
**Students:** Practice the skill or strategy.



1. Read page 6 (stopping at “It Floats”) aloud. Use **Think-Pair-Share** to prompt use of the skill or strategy.

**What do you think “coaxed into existence” means? How did you figure this out?**

*(Answers may vary.) The article talks about different forms of ice and says that other water ices can be “coaxed into existence” in labs under controlled conditions. I know that coaxing means encouraging or nudging. So if you are coaxing something into existence, it doesn’t just happen by itself. You have to work at it.*

**What does this phrase tell you about ice?**

*It sounds like maybe some ice can actually be made in a lab if there are certain conditions. I know that things can be made in labs. The ice isn’t already there, but it can be created.*

2. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read the first column of “It Floats,” stopping before “It also makes ice skaters possible.”

Use **Think-Pair-Share** to ask:

**What did you clarify as you read?**

*I clarified a property of Ice 1h. Solids are usually denser than their corresponding liquids, or the liquid form of the solid. Molecules in solids are packed very tightly compared to liquids. This is why solids sink. However, 1h floats because water is denser than 1h. This is unlike most solids.*

Use **Random Reporter** to debrief.

3. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

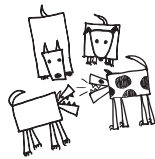
**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.



**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.

## Sample Graphic Organizer

- I. Ice 1h
  - A. Common substance
    1. Found on Earth
  - B. Strange qualities
    1. Temp freezing = cold water denser
    2. Floats
  - C. Result of its qualities
    1. Water freezes from top, not bottom
    2. Can ice-skate outside



## Teamwork tp

(20–30 minutes)

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

### Partner Prep

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: sr  
**pages 7 and 8 (stopping at “It’s Crystal Clear”) aloud with partners. (if skipping Interactive Read Aloud, pages 6–8 [stopping at “It’s Crystal Clear”])**
2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

### Team Discussion

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. sr
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team’s strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team’s graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students’ reflection as they determine the meaning of the “(Write)” question.

Cue students to use their student routines for strategy use and Team Talk discussion.

Team Talk Questions

1. Why do you think the author includes information about the novel *Cat's Cradle* at the beginning of the article? **[AP, DC, SA]** (Team Talk rubric)

100 = *I think the author includes information about *Cat's Cradle* at the beginning because it gets a reader interested in the article's **topic**. The topic is that ice 1h floats, and this **quality results** in liquid water. The **novel** is about all liquid water turning to ice. The author writes that this doesn't happen but asks "Or does it?" Including information about *Cat's Cradle* **creates interest in the answer to the question posed**.*

90 = *I think the author includes information about *Cat's Cradle* at the beginning because it gets a reader interested in what he or she will read. The article is about ice 1h floating. The book is about all liquid water turning to ice. The author writes that this doesn't happen.*

80 = *It gets a reader interested in what he or she will read.*

2. What is ice 1h? What quality of ice 1h makes it important to life on Earth? Explain. **(Write) [CV, MI]** (Team Talk rubric)

100 = *Ice 1h is the type of ice **commonly** found on Earth. It is the type of ice you have in your freezer. The quality of ice 1h that makes it important to life on Earth is the fact that it is less dense than liquid water, so it floats. This means that when water freezes, it forms on the surface first and does not sink to the bottom. This is important because if it sank on the bottom, the sun could not melt it and eventually all the water in the world would freeze and we would not have the liquid water that is necessary for life. **Ice 1h allows us to have liquid water**.*

90 = *Ice 1h is the type of ice found on Earth. The quality that makes it important to life on Earth is that liquid water is thicker than ice 1h, so ice 1h floats. This means that when water freezes, it forms on the surface first and does not sink to the bottom. This is important because if it sank on the bottom, the sun could not melt it and then all the water in the world would freeze.*

80 = *Ice 1h is the type of ice found on Earth. Liquid water is thicker than ice 1h, so ice 1h floats.*

*continued*

Team Talk Questions *continued*

3. After reading the first half of “The Truth About Ice-Nine,” which of the following best states the main idea? **[MI, AP, SA]** (Team Talk rubric)
- Kurt Vonnegut wrote about Ice-nine.
  - The ice on Earth is called 1h.
  - Earth would be very different if ice did not float.*
  - Bodies of water freeze from the top down, not from the bottom up.

Explain how you identified the main idea.

*100 = I identified choice C as the main idea because many details describe how Earth would be different if ice did not float. Choice D explains more about this idea. Choice A is an unimportant detail from the article, and B just gives the name of a type of ice. The article describes how if ice didn't float, everything on Earth could freeze. This would be very different from how the planet currently is. Thinking about what information was a detail helped me identify the main idea.*

*90 = Choice C is the main idea because that is what many details talk about. Choice D explains more about this idea. Choice A is an unimportant detail from the article, and B just gives the name of a type of ice.*

*80 = Choice C is the main idea because that is what many details talk about.*

4. Choose a word from the vocabulary list, and write a meaningful sentence using the word correctly. **[CV]**

*Accept a sentence that shows that the student knows the meaning of the word and can use it correctly. For example: Since Marissa stayed up late every night studying, she was prone to feeling tired in school the next day.*

- Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.
- Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
- If some teams finish ahead of others, have them practice their fluency.
- Award team celebration points for good team discussions that demonstrate 100-point responses.

Cue students to discuss strategy use, graphic organizers, and word power journals.

Randomly select team representatives who will share:



- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.



# Class Discussion

(20 minutes)

## Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.

## Celebrate

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Lesson 4

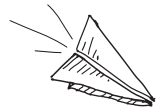
**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

### Teacher Background

Today students will read the second half of “The Truth About Ice Nine.” This half explains how hydrogen bonds contribute to the existence of different types of ice. It also explains that Ice 1X is not a threat to life on Earth because it could not survive outside a laboratory. A phase diagram and an explanation of how to use the diagram to extract information are also included.

#### Teacher’s Note:

Use the Interactive Read Aloud if your students need additional support. Otherwise, build background, and then go directly to teamwork. Adjust partner reading page numbers accordingly.



## Active Instruction

(15–25 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don’t know this word; it’s totally new to me.

Teams discuss their vocabulary ratings.



Review Vocabulary Vault.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

### Vocabulary

1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a “+” and a word the entire team rated with a “?”.
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Use **Random Reporter** to have teams report on a new sentence using a vocabulary word. Award team celebration points.
3. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

Teams review their cycle goal.

Post and present the reading objective.



**Teacher:** Read aloud.

**Students:** Practice the skill or strategy.



**Partner pairs:** Read aloud/think aloud with the next passage to practice the skill or strategy.

### Set the Stage

1. Ask students to review their team’s goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and reading objective.
4. Have teams discuss and report on their preview of the text and explain their thinking. Use **Random Reporter** to share team responses.

**T:** Crystals and molecules—temperature and pressure

**I:** To explain structures of ice

**G:** Outline

### Interactive Read Aloud

1. Read the section “It’s Crystal Clear” on page 8 aloud. Use **Think-Pair-Share** to prompt use of the skill or strategy.

#### What does the word *reconfigure* mean, and how did you clarify this?

*(Answers may vary.) Reconfigure means rearrange. I used two strategies to figure out this word. First, I looked for word parts that I knew. I recognized the prefix re-, which means again. Some other words with this prefix are redo and rewrite. I haven’t seen configure before, but I have seen figure. Figure means to find the meaning, like when you figure out something. It didn’t seem like this made sense, so I used context clues. Water molecules are flexible. This means they can change. If they can reconfigure in several ways, it sounds like they can rearrange themselves, or move again and change into something new.*

2. Partner Practice: Student partner pairs use the read-aloud/think-aloud process to practice the skill or strategy with the next passage in the text. Have students read “Fact vs. Fiction” on page 8.

Use **Think-Pair-Share** to ask:

#### How does the word *radically* help you understand the Ice IX that Dr. Hoenikker could make in his lab?

*It says that Dr. H would need temperatures below -200 degrees F and very high pressure. It says that if he radically refrigerated a water droplet and increased the pressure, he’d get an Ice IX crystal. I know that radical means extreme. My teacher always tells me to think things through before I do something radical. She means that I shouldn’t just go and do something crazy. The author is saying that to get Ice IX, Dr. H would have to really do something extreme.*



**Partner pairs:** Review, reread to clarify, and add to the graphic organizer.

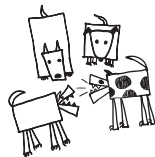
Use **Random Reporter** to debrief.

3. Ask partners to review this section of text, check their understanding with each other, reread what they need to clarify, and add notes to their graphic organizers.

Use **Random Reporter** to debrief. Add student responses to the graphic organizer.

A sample graphic organizer follows.

Sample Graphic Organizer	
I.	Ice 1h
A.	Common substance
1.	Found on Earth
B.	Strange qualities
1.	Temp freezing = cold water denser
2.	Floats
C.	Result of its qualities
1.	Water freezes from top, not bottom
2.	Can ice-skate outside
D.	Hydrogen bonds—flexible and reconfigure
1.	hexagons
2.	Space between why less dense thru surrounding holes—floats
3.	Kind of ice depends on temperature and pressure



## Teamwork tp

(20–30 minutes)

### Partner Prep

1. Explain, or review if necessary, the student routines for partner reading, word power, fluency, and the TIGRRS process before having students read and restate: sr

**page 9 (including top and bottom text boxes) aloud with partners.**

**(if skipping Interactive Read Aloud, pages 8 and 9)**

2. Circulate and check for comprehension, evidence of strategy use, and use of the TIGRRS process, for example, restating ideas on the graphic organizer. Give students feedback. Prompt and reinforce their discussions.
3. If some partners finish ahead of their teammates, have them begin looking over the Team Talk questions.

Cue students to use their student routines for partner reading, word power, fluency, and the TIGRRS process.

Cue students to use their student routines for strategy use and Team Talk discussion.

### Team Discussion

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion. **Sf**
2. Remind students to use the rubrics on their team folders to prepare each team member to discuss the team's strategy use, oral and written Team Talk responses, word power, and fluency. Each team member must be able to summarize the text and discuss the team's graphic organizer/notes during Class Discussion as indicated.
3. Preview the Team Talk questions. If necessary, ask questions to guide students' reflection as they determine the meaning of the "(Write)" question.

#### Team Talk Questions

1. Why is the caption important under figure 3? **[AP, SA]** (Team Talk rubric)
 

100 = *The caption under figure 3 is important because it explains what the different colors **represent** in the clathrate hydrate. This helps me understand that most of a clathrate hydrate is made up of water molecules. The text to the left of figure 3 **describes** what a clathrate hydrate looks like, but actually seeing it helps the description make sense. Without the caption, the **visual** wouldn't be **meaningful**.*

90 = *The caption under figure 3 is important because it explains what the different colors are in the clathrate hydrate. This helps me understand that most of a clathrate hydrate is made up of water molecules.*

80 = *It explains what the different colors are in the clathrate hydrate.*
2. Is Ice IX a threat to life on Earth? Why or why not? Use information from figure 2 and the facts on page 9 to support your answer. **(Write) [CV, SA]** (Team Talk rubric)
 

100 = *Ice IX is not a threat to life on Earth because it can only form in a laboratory. Ice IX forms when the temperature is -200 degrees F and the pressure is 2,000 to 4,000 times the pressure of Earth's atmosphere. In figure 2, Ice IX **appears** on the phase diagram in the upper left where the temperature is very low and the pressure is very high. **Also**, page 9 explains that a water crystal could not withstand a temperature of 114 degrees F and end life. Using a **text feature** helped me **determine** that Ice IX isn't a threat to life on Earth.*

90 = *Ice IX is not a threat to life on Earth because it can only form in a laboratory. Ice IX forms when the temperature is -200 degrees F and the pressure is 2,000 to 4,000 times the pressure of Earth's atmosphere. Page 9 explains that a water crystal could not withstand a high temperature.*

80 = *No, because it can only form in a lab.*

continued

Team Talk Questions *continued*

3. Summarize the section “When is solid water not an ice?” (summary rubric)

*100 = Solid water is usually thought of as being ice, but this is not always the case. Clathrate hydrates are an example of this exception. They can be found within the solar system and under extreme conditions on Earth, for example, at very low temperatures under high pressure. Water without a shape forms when water cools so quickly that its molecules are unable to form their regular pattern. Solid water refreezes and water scatters through space.*

*90 = Solid water is usually thought of as being ice, but this is not always the case. Clathrate hydrates are not ice. They can be found within the solar system. Water without a shape forms when water cools so quickly that its molecules can't form their regular pattern.*

*80 = Solid water is not always ice. Clathrate hydrates are found in the solar system. Water with no shape forms when water cools really fast.*

4. What is a synonym for the word *latent*? What is an antonym for the word *latent*? **[CV]**

*The word latent means something isn't seen, so a synonym is hidden. An antonym is obvious.*

Cue students to discuss strategy use, graphic organizers, and word power journals.

4. Have students thoroughly discuss Team Talk questions before they write individual answers to the skill question marked “(Write).” Allow students to revise their written answers after further discussion if necessary.
5. Prompt teams to discuss comprehension problems and strategy use (their sticky notes), important ideas that they added to their graphic organizers, and words that a team member added to the word power journal.
6. Circulate and give feedback to teams and students. Use rubrics to give specific feedback. Ask questions to encourage further discussion. Record individual scores on the teacher cycle record form.
7. If some teams finish ahead of others, have them practice their fluency.
8. Award team celebration points for good team discussions that demonstrate 100-point responses.

Randomly select team representatives who will share:



- strategy use
- oral and written Team Talk responses
- word power discussions
- fluency selection

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.



# Class Discussion tp

(20 minutes)

## Lightning Round

1. Use **Random Reporter** to have teams share strategy use, oral and written Team Talk responses, word power discussions, and fluency. Ask other teams to agree, disagree, or add on to responses.
2. Use rubrics to evaluate responses and give specific feedback. Award team celebration points for 100-point responses. Record individual scores on the teacher cycle record form.

## Celebrate

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

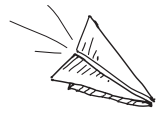
- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Lesson 5

**Writing Objective:** Use key scientific terms and definitions from the text to explain a process.

### Teacher Background

The writing prompt will give students an opportunity to revisit this cycle’s Big Questions. The purpose of the Big Questions was to tap into students’ background knowledge about ice. Students may not have known that ice plays an important role in medicine or that ice is involved in moons being born on Saturn. Now that they have read this cycle, they can use their new knowledge to answer these questions. When they revisit the Big Questions, they may also realize that they had misconceptions about ice.



## Active Instruction

(10 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don’t know this word; it’s totally new to me.

Teams discuss their vocabulary ratings.



Review Vocabulary Vault.

Teams review their cycle goal.

Post and present the writing objective.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

### Vocabulary

1. Have teams discuss their ratings of the words. Ask teams to make a tent with their hands when they are ready to tell a word the entire team rated with a “+” and a word the entire team rated with a “?”.
2. Use **Random Reporter** to have the teams share one word that they know and one word that they need to study further. Use **Random Reporter** to have teams report on a new sentence using a vocabulary word. Award team celebration points.
3. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.

### Set the Stage

1. Ask students to review their team’s goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and writing objective.

Introduce the writing project.

Read the prompt aloud.



Students identify the purpose for writing.

Refer student to the appropriate writer's guide in their student editions.

Highlight the writing objective.

- The writing project asks students to answer this cycle's Big Questions again now that they have read. The writing objective is to use scientific terms and definitions to explain a process. Some processes they will likely include are how ice is used in heart surgery, why Ice 1H is so important to Earth, and the relationship between icequakes and climate. To write a thorough response, students will need to use scientific terms to clearly explain the processes that result in different uses of ice.
- Refer students to the following writing prompt in their student editions. Read the writing prompt aloud.

Writing Prompt
Is all ice the same? Does ice have one use or many uses? Include scientific terms and processes that you've learned from this cycle's readings to support your response.

Use **Think-Pair-Share** to ask:

**Read the prompt. What is it asking you to do: support a claim with reasons, explain ideas or information on a topic, or write a literary response? How do you know?**

*The prompt is asking me to explain information on a topic. I know because the topic is whether all ice is the same and has one or many uses. I will have to explain information that supports my answer.*

- Refer students to the following writer's guide in their student editions. Point out that this guide for Writing to Inform or Explain is the criteria for writing. Point out that using the writer's guide will help them write a quality response.

Writing to Inform or Explain	
<b>Ideas</b>	<ul style="list-style-type: none"> <li>Clearly introduce the topic.</li> <li>Develop the topic with relevant details.</li> </ul>
<b>Organization</b>	<ul style="list-style-type: none"> <li>Begin by introducing the topic.</li> <li>In the middle, provide facts, examples, or events that help a reader understand the information.</li> <li>End with a closing statement that supports the information.</li> </ul>
<b>Style</b>	<ul style="list-style-type: none"> <li>Use words and phrases that help a reader understand how the facts or events are related.</li> <li>Include details or examples that help a reader make a mind movie.</li> </ul>
<b>Mechanics</b>	<ul style="list-style-type: none"> <li>Use correct punctuation, capitalization, spelling, and grammar.</li> </ul>

Briefly review the guide, noting the four aspects of writing: ideas, organization, style, and mechanics.

Use **Think-Pair-Share** to ask:

**Which guideline relates to our writing objective, using scientific terms to explain a process?**

*Ideas and organization. Ideas says to develop the topic with relevant details, so using scientific terms will be included in these details. Organization says to provide examples that support the topic, and this can be done by using scientific words and explaining processes.*

- Tell students that this 10-minute writing project is practice to prepare them to write a quality answer for the writing section (part II) of the cycle test. Remind them that this section of the test is worth one third of their test score.

### Model a Skill

- I will show you the topic sentence that I wrote. One of the criteria for ideas is clearly introducing the topic. A criterion for organization is to begin by introducing the topic. Therefore, a strong topic sentence is important.** Read the following topic sentence:

Ice can be different.

- Use **Think-Pair-Share** to ask:

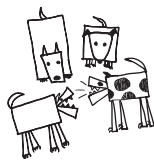
**Is this a strong topic sentence? Why or why not?**

*No, this is not a strong topic sentence. It doesn't tell a reader very much, and it doesn't make it clear which part of the Big Questions is being answered—it could be answering the part that asks if all ice is the same or the part that asks if ice has more than one use.*

**How could this topic sentence be improved?**

*(Answers may vary.) Contrary to popular belief, all ice is not the same, and it can actually have different purposes.*

*Another example: Although many people think that all ice is the same, there can be differences among ice in both appearance and how it is used.*



## Teamwork

(20 minutes)

### Independent Work

Tell students that they have 10 minutes to plan and write drafts of their responses to the writing prompt. Remind them to write on every other line to leave room for revisions. Suggest that they refer to the writing prompt to be sure that they include all the required elements and to the writer's guide to check the quality of their response.

Model writing a topic sentence.

tps

Students write for 10 minutes.

Monitor discussions as partners and teams give feedback.

Students revise and edit their writing projects.

Display and evaluate randomly selected writing projects using the writer's guide.

### Team Discussion

1. Refer students to the peer feedback checklist in their student editions, and review how to get/give feedback.
2. Have students share their drafts in teams. Allow 5 minutes for students to revise their writing projects based on feedback and to edit them using the editing checklist in their student editions.
3. Have teams put their writing projects in a pile in the middle of their tables so a writing project can be randomly selected.



## Class Discussion

(30 minutes)

### Lightning Round

Randomly select a writing project from one or two teams' piles without revealing their authors. Display a writing project, and read it aloud.

Refer students to the writer's guide for Writing to Inform or Explain and the writing objective—using scientific terms and definitions from the text to explain a process.

Using the writer's guide, discuss and evaluate the selected writing project(s) with the class.

For example, ask:

- **Does the writer introduce the topic clearly?**
- **Does the writer include facts and examples to help a reader understand the information?**
- **Does the writer end with a closing statement that supports the information?**
- **Does the writer use appropriate academic language and full sentences?**

Award points to teams whose writing projects meet the criteria. Record these points on the team poster.

### Reflection on Writing

Have students reflect on their use of the writing process. Ask:

**How did creating and using a graphic organizer work for you? How did it help you write your draft?**

*Answers will vary.*

**What was the most useful feedback that you received? How did it affect your revisions?**

*Answers will vary.*

**Did you find it easy or difficult to explain processes? Explain.**

*Answers will vary.*

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

### **Celebrate**

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Writing Prompt

Is all ice the same? Does ice have one use or many uses? Include scientific terms and processes that you've learned from this cycle's readings to support your response.

Writing to Inform or Explain	
<b>Ideas</b>	<ul style="list-style-type: none"><li>• Clearly introduce the topic.</li><li>• Develop the topic with relevant details.</li></ul>
<b>Organization</b>	<ul style="list-style-type: none"><li>• Begin by introducing the topic.</li><li>• In the middle, provide facts, examples, or events that help a reader understand the information.</li><li>• End with a closing statement that supports the information.</li></ul>
<b>Style</b>	<ul style="list-style-type: none"><li>• Use words and phrases that help a reader understand how the facts or events are related.</li><li>• Include details or examples that help a reader make a mind movie.</li></ul>
<b>Mechanics</b>	<ul style="list-style-type: none"><li>• Use correct punctuation, capitalization, spelling, and grammar.</li></ul>

## Lesson 6

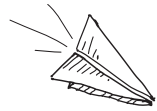
**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

**Writing Objective:** Use key scientific terms and definitions from the text to explain a process.

### Teacher Background

Today’s cycle test challenges students to continue clarifying scientific terms so they can explain processes in their reading.

For the assessment, students will read “Ice Blankets.” This article describes the harmful impact that frost can have on cranberry crops. Ice blankets play an important role in protecting cranberries, and this is explained in detail. There are also various methods that growers use to track temperature so they know when frost may occur. These methods are also explained in detail.



## Active Instruction

(5 minutes)

Students use the vocabulary study routine to rate their knowledge of each vocabulary word:

- + I know this word and can use it.
- ✓ This word looks familiar; it has something to do with...
- ? I don’t know this word; it’s totally new to me.

Teams review their cycle goal.

Post and present the reading and writing objectives.

Review Vocabulary Vault.

### Partner Vocabulary Study

1. Display the vocabulary words. Have students use the vocabulary study routine as they rerate their knowledge of each vocabulary word as they arrive for class.
2. Spot check the Read and Respond homework.

### Set the Stage

1. Ask students to review their team’s goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Remind students of the texts, authors, and reading and writing objectives.
4. Remind teams that if they find a word from the vocabulary list used in another place, such as in a magazine, textbook, TV ad, etc., they can bring in or copy the sentence in which the word was used and put it in the Vocabulary Vault to earn team points.



# Prepare Students for the Test tp

(5 minutes)

tps

## Partner Review

1. Remind students that they have been practicing using strategies to clarify the meaning of terms used in scientific text and using scientific terms and definitions to explain processes. Use **Think-Pair-Share** to ask:

### What is a term that you clarified this cycle?

*(Answers will vary.) I clarified synthetic. Dr. Elefteriades can repair aneurysms with a synthetic patch before a patient needs emergency surgery.*

### How did you clarify this?

*(Answers may vary.) I used context clues. Since Dr. Elefteriades can repair an aneurysm with a synthetic patch before it reaches the stage where a patient needs surgery, it seems like the patch is doing what the surgery would usually do. It might be something that he is creating to prevent the surgery.*

### What does this term help you understand?

*Since he is using the patch instead of doing surgery, it sounds like maybe it is something fake or unnatural.*

Tell students that they will use this skill as they take the cycle test.

2. Have partners review their notes and word power journals for this cycle. Allow 2 or 3 minutes for this activity.

## Test Directions

1. Remind students that the test is independent work. Students should not ask their partners for help as they read, but they may use sticky notes if they would like.
2. Distribute the test so students can preview the questions. Point out that some of the test questions are multiple choice for which they will choose the best answer. Other questions require them to write a short answer or create a graphic organizer. Part II of the cycle test requires them to write a long answer. Remind them that their writing project was practice for writing the long answer for part II of the test.
3. Point out that questions #2 through #5 ask about explaining ideas using scientific terms from the text.
4. Ask students to identify key words or phrases in question #5.

5. Explain why cranberries are not grown in frost-free areas. <b>[CV, RE]</b>
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5. Introduce the text that students will read. Tell what it is about, but do not give additional information or details.

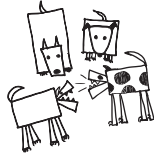
**Today you will read about the damage that frost can cause to cranberries and how damage can be prevented.**



## Test tp

(30 minutes)

Tell students that they have 30 minutes for the test and that they may begin. Give students a 5-minute warning before the end of the test.



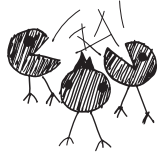
## Teamwork tp

(10 minutes)

### Team Discussion

Teams discuss the answers to the test questions.

1. Pass out a colored pen to each student.
2. Explain or review, if necessary, the student routine for team discussions after the test.
3. Have teams discuss their answers to the test questions. As you monitor team discussions, ask additional questions to prompt their thinking about the important ideas in the reading and about the skills and strategies that they have been using.



## Class Discussion tp

(10 minutes)

### Lightning Round

Random Reporters share team discussion of a test question.



1. Use **Random Reporter** to have teams share team discussions of the test questions and explain their thinking.

Use **Think-Pair-Share** to ask:

**Could you relate “Ice Blankets” to other articles you read this cycle? Explain.**

*(Answers may vary.) I could relate “Ice Blankets” to “It’s an Icequake!” In “Ice Blankets,” I learned that frost can damage cranberries. In “It’s an Icequake!” I learned that when a stuck glacier is freed, it jerks forward and can result in a lot of damage. Both of these articles show the huge impact that ice can have and the damage it can cause.*

2. Award team celebration points.
3. Collect test answers. Score original answers, and add extra points for improved answers.

Celebrate team successes!

The top team chooses a cheer.

Remind students of the Read and Respond homework assignment.

### **Celebrate**

1. Tally the team scores on the poster, and celebrate teams that are accumulating points. Have teams reflect on the following questions:

**How many points did your team earn today?**

**How can your team earn more points?**

Remind students that top-scoring teams will earn bonus points that will be added to their cycle scores.

- Something to cheer about: Choose a behavior or learning outcome that you would like to reinforce, and reward that behavior by asking students to lead a cheer of their choice.
2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.

## Cycle 2 Test

## Clarify Words in Science

**Directions:** Read “Ice Blankets,” pages 34–36. Use the TIGRRS process, and answer the following questions on a separate piece of paper.

**Part I. Comprehension** (100 points)

1. What is the topic?

*5 points = The topic of the text is using ice blankets to protect cranberries.*

What is the author’s intent?

*5 points = The author’s intent is to inform the reader about ice blankets.*

Write a short summary of the text. Include the graphic organizer or notes that you used to organize the information and your thoughts. **[MI, AP]**

*10 points = “Ice Blankets” is about how frost can damage cranberry crops and how a coating of ice can protect the crop from frost damage. Cranberries grow on vines in low-lying areas. Cranberries are perennial, meaning they return each spring without being replanted, and must be cared for properly during the winter so they survive. Cranberry growers monitor temperatures in the vines. Sprinkler irrigation systems spray the crops so ice forms and insulates the cranberries.*

2. Why do growers have to protect cranberry plants all year long? **[CV, MI]**

*20 points = Growers have to protect cranberry plants all year long because the plants are perennial, which means the same plant produces fruit from year to year. If the buds are frozen during the winter, the fruit will not form the next year. Cranberry plants need to be protected so the fruit continues to form.*

*15 points = Growers have to protect cranberry plants all year long because the plants are perennial. The same plant grows fruit from year to year. If the buds are frozen, the fruit will not form.*

*10 points = The plants are perennial. The same plant grows fruit from year to year.*

3. Explain why a blanket of ice protects plants. **[CV, SA]**

*20 points = Ice protects plants because as water freezes or ice melts, molecules move around so they release energy as heat. This is called latent heat, and it protects cranberries from damage. Also, the plant creates heat that is trapped by the ice blanket and keeps it warm. If there was no ice blanket and latent heat, the plants and cranberries would be damaged by cold temperatures and wind.*

15 points = *Ice protects plants because as water freezes or ice melts, molecules move around, so they let out energy as heat. This is called latent heat, and it protects cranberries. Also, the plant makes heat that is trapped by the ice blanket and keeps it warm. If there was no ice blanket and latent heat, the plants and cranberries would be damaged.*

10 points = *As water freezes or ice melts, molecules let out energy as heat.*

4. Use information from “Bells on the Bog” to explain how cranberry growers know when frosts might happen. **[MI, SA]**

20 points = *There are **various** ways that cranberry growers know when frosts might happen. A special weather forecast predicts overnight low temperatures. Another **system** is linked two-way radios connected to instruments that measure temperatures in the vines. If the temperature gets too low, there is a spoken message that states the temperature. A special computer checks the temperature and sounds an alarm when the temperature is too low. Some growers even connect the alarms to their cell phones. Different tools help growers know when frost might **occur** so they can protect their crops.*

15 points = *There are many ways that cranberry growers know when frosts might happen. A special weather forecast predicts overnight low temperatures. Linked two-way radios are connected to instruments that measure temperatures. A special computer checks the temperature and sounds an alarm when the temperature is too low.*

10 points = *Ways they know are a weather forecast, linked two-way radios, and a special computer.*

5. Explain why cranberries are not grown in frost-free areas. **[CV, RE]**

20 points = *Cranberries grow in areas with cold temperatures. They grow in sandy bogs and low-lying areas where temperatures are lower and frost is likely to form. Low-lying areas are colder because cold air tends to sink. The article mentions research that shows that cranberries need cold temperature to form buds in the spring. Frost-free areas do not provide the colder **conditions** that cranberries **require** to grow and bear fruit.*

15 points = *Cranberries grow in areas with cold temperatures. They grow in sandy bogs and low-lying areas where temperatures are lower and frost is likely to form. Low-lying areas are colder because cold air tends to sink. The article mentions research that shows that cranberries need cold temperature to form buds in the spring.*

10 points = *Cranberries grow in areas with cold temperatures.*

**Part II. Writing** (100 points)

Write at least one paragraph to answer the following question:

Explain how cranberries are harvested.

*Cranberries are harvested using two different methods, wet harvest and dry harvest. In wet harvest, the growers flood the cranberry bogs. Because cranberries have small chambers filled with air inside them, they float on the surface of the water. A machine skims the surface and collects the cranberries for use in juice and other foods. The fields are not flooded in a dry harvest. Machines with combs pull the cranberries off the vines and put them in bags. Then the bags are taken out by helicopter and are sold as fresh cranberries.*

The following guide is used to score part II of the cycle test.

Writing to Inform or Explain		
<b>Ideas</b>	<ul style="list-style-type: none"> <li>Clearly introduces the topic</li> <li>Develops the topic with relevant details</li> </ul>	<b>0–25 pts.</b>
<b>Organization</b>	<ul style="list-style-type: none"> <li>Begins by introducing the topic</li> <li>In the middle, provides facts, examples, or events that help a reader understand the information</li> <li>Ends with a closing statement that supports the information</li> </ul>	<b>0–25 pts.</b>
<b>Style</b>	<ul style="list-style-type: none"> <li>Uses words and phrases that help a reader understand how the facts or events are related</li> <li>Includes details or examples that help a reader make a mind movie</li> </ul>	<b>0–25 pts.</b>
<b>Mechanics</b>	<ul style="list-style-type: none"> <li>Uses correct punctuation, capitalization, spelling, and grammar</li> </ul>	<b>0–10 pts.</b>
<b>Writing Objective</b>	<ul style="list-style-type: none"> <li>Use key scientific terms and definitions from the text to explain a process.</li> </ul>	<b>0–15 pts.</b>

**Part III. Vocabulary** (100 points)

- The product was \_\_\_\_\_ studied to make sure that all the ingredients were safe for consumers.

Choose the word that belongs in the blank. **[CV]**

- A. latent
- B. apocalyptic
- C. peculiar
- D. clinically

- Write a meaningful sentence using the word *ambient*. **[CV]**

*Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: The ambient light in the restaurant was dim, so there was a candle on each table for more light.*

3. Janna's clay was \_\_\_\_\_ until she molded it into a bear.

Choose the word that belongs in the blank. **[CV]**

- A. clinically
- B. *amorphous*
- C. gravitational
- D. latent

4. Which of the following might cause someone to have apocalyptic ideas?

Explain why. **[CV]**

- A. a sunny day
- B. *an earthquake*
- C. delicious food
- D. a vacation

*An earthquake might cause someone to have apocalyptic ideas because it is a natural disaster. Apocalyptic means predicting disaster. A sunny day, delicious food, and a vacation are happy things that don't have anything to do with disaster.*

5. Since it was such a warm day, it was \_\_\_\_\_ to see Michael wearing a heavy winter coat.

Choose the word that belongs in the blank. **[CV]**

- A. *peculiar*
- B. latent
- C. amorphous
- D. prone

6. In which of the following examples is an object not latent? **[CV]**

- A. a folder in a desk
- B. a gift in a box
- C. *a sign in a window*
- D. paper in a drawer

7. What is a synonym for *prone*? What is an antonym for *prone*? **[CV]**

*A synonym for prone is likely, and an antonym is unlikely.*

8. \_\_\_\_\_ forces broke up the comet before it impacted Jupiter.

Choose the word that belongs in the blank. **[CV]**

- A. Peculiar
- B. Amorphous
- C. Latent
- D. *Gravitational*

9. What is one word that you or your teammates explored in your word power journal this cycle? Give the meaning of this word, and then use it in a meaningful sentence. **[CV]**

*A word that we explored was remarkable. It was used in the sentence "Our remarkable ability to recover from trauma..." Remarkable means really great or amazing. A sentence using remarkable is "Since Shaun was recovering from laryngitis, it was remarkable that he was able to sing so well."*

10. As used in the sentence "If the aneurysm were to suddenly burst, blood would spew out..." *spew* most nearly means— **[CV]**
- A. rush out.
  - B. stay back.
  - C. take in.
  - D. turn red.

Explain how you figured out the meaning of *spew*.

*Students will explain their thinking. For example, I used the context. The passage talks about something suddenly bursting, so B and C don't fit. Something that is bursting probably isn't staying back. Blood is already red, so D doesn't fit. Rushing out makes sense. The sentence also says if an aneurysm bursts, a patient has to get to a hospital soon, so the blood is probably rushing out.*

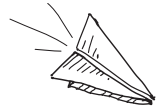
Question Codes			
<b>[DC]</b>	Make inferences; interpret data; draw conclusions.	<b>[AA]</b>	Analyze an argument.
<b>[SA]</b>	Support an answer; cite supporting evidence.	<b>[AP]</b>	Identify author's intent or purpose.
<b>[MI]</b>	Identify the main idea that is stated or implied.	<b>[RE]</b>	Analyze relationships (ideas, story elements, text structures).
<b>[CV]</b>	Clarify vocabulary.	<b>[AC]</b>	Author's craft; literary devices

## Lesson 7

**Reading Objective:** Use strategies to clarify the meaning of symbols, key terms, and other words and phrases used in scientific and technical text.

**Teacher Background**

During Class Discussion, students orally present evaluations of their homework reading selections. During Teamwork, students use their Read and Respond notes and answers to the homework questions to make final preparations for these presentations. Team members share their responses and give one another feedback. During the oral presentations, students use their revised responses to the questions to describe the kind of texts they read, the strategies that helped them understand the text, and whether they will recommend their reading selections to others.

**Active Instruction** 

(20 minutes)

Two-Minute Edit

**Two-Minute Edit**

1. Display and have students complete the Two-Minute Edit as they arrive for class.
2. Use **Random Reporter** to check corrections. Award team celebration points.

Vocabulary Vault

**Vocabulary**

Ask teams if they have a Vocabulary Vault word that they would like to share. Award team celebration points.

Teams review their cycle goal.

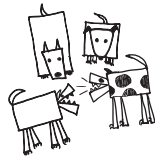
**Set the Stage**

1. Ask students to review their team's goal for this cycle and assess their progress.
2. Review the Team Celebration Points poster, and challenge teams to build on their successes.
3. Have students get out their reading selections and Read and Respond forms. Remind them that today, with the help of their teams, they will each prepare a presentation about their individual reading selections.

Challenge students to think about the strategies and skills that they used to read their self-selected texts, share their answers to the Read and Respond questions, discuss their thinking, and prepare evaluations of their selections.

Connect the cycle objective to students' homework reading selections.

4. Remind students to add to the notes on their Read and Respond forms as they discuss their selections and prepare oral presentations about their selections. Students will use their answers to the questions on the Read and Respond form as the basis for their presentations.



# Teamwork tp

(25 minutes)

## Team Discussion

1. Tell students that they will use the Read and Respond questions as a guide as they discuss their homework reading and prepare evaluations of their reading selections to share with their teams.
2. As students prepare their answers, check in with those students for whom you do not have individual scores for graphic organizer/notes, written Team Talk responses, word power journal, and/or a fluency score. Have them show you examples from the cycle. Point out areas of success, and give feedback to improve student performance.
3. As you visit teams, take this opportunity to check students' homework for completion (Read and Respond forms). Enter the information on your teacher cycle record form.

Students prepare, share, and revise presentations about their reading selections.

Give students feedback on classwork.

### Teacher's Note:

Have students who are ready for a new selection take turns choosing reading material from the classroom library. Make sure that every student has a Read and Respond form for next cycle.

## Read and Respond Questions

1.	Is your selection informational or literature? Summarize your reading. (summary rubric)
2.	Why did you choose this reading? What is your purpose for reading? (Team Talk rubric)
3.	Choose a word, phrase, or passage that you did not understand at first. How did you figure it out? (strategy-use rubric)
4.	Write down a question that you had or a prediction that you made as you read. Were you able to answer or confirm it? Explain. (strategy-use rubric)
5.	Would you recommend this selection to others to read? State your opinion, and support it with reasons. (Team Talk rubric)
6.	Choose a short section of the text that you think is important or especially interesting. Tell your teammates why you chose it. Read it aloud smoothly and with expression. (fluency rubric)



# Class Discussion

(15 minutes)

Teams report on their review of the texts and Read and Respond discussions.



Celebrate team successes!  
Final tally for this cycle

Record team celebration points on the teacher cycle record form.

Collect Read and Respond forms for this cycle.

## Lightning Round

Use **Random Reporter** to have students present their evaluations of their homework reading selections (responses to the Read and Respond questions). Use rubrics to evaluate responses, give specific feedback, and award points.

## Celebrate

1. Tally up this cycle's points on the poster.
2. Tell students that their scored tests will be returned at the beginning of the next lesson. Poster points and the teams' test scores will determine which teams earn the status of super team, great team, or good team for the cycle.
3. Be sure to record each team's total celebration points from the poster into the teacher cycle record form. Remind students that team celebration points and team test averages are used to determine team scores.
4. Collect students' Read and Respond forms, and pass out new forms.
5. Tally up the number of Read and Respond signatures on students' forms, and record the number on the teacher cycle record form after class.

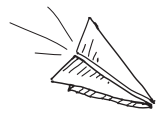
# Lesson 8

**Objectives:** Celebrate successes and set new goals. Hold a Class Council meeting.

## Teacher Background

In the first part of this lesson, students review their test results and their final scores for the cycle and compare them with their goals. They celebrate success and set new objectives for further improvement.

In the second part of the lesson, students participate in Class Council.



## Active Instruction

(2 minutes)

### Two-Minute Edit

1. Display and have students complete the Two-Minute Edit as they arrive for class.
2. Use **Random Reporter** to check corrections. Award team celebration points.



## Celebrate/Set Goals

(20 minutes)

1. Distribute students' scored cycle tests. Allow a few moments for students to review them.
2. Distribute team score sheets to teams and celebration certificates to students. Remind students that the cycle's top-scoring teams are determined by their points on the poster and their test scores.
3. Recognize and celebrate the super, great, and good teams. Remind the teams of the impact of bonus points that are added to team members' cycle scores.
4. Have each team discuss and set a goal for the next cycle and record it on their team score sheet. Use the questions below to analyze and discuss the students' scores.

**What was your team's highest score?**

**What score do you want to improve?**

**What can the team do to improve that score?**

Two-Minute Edit



Distribute scored cycle tests.

Distribute team score sheets and celebration certificates.

Class celebration! Celebrate team successes with a class cheer.

Each team sets a team goal for the next cycle.

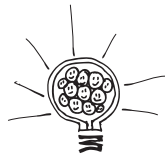


Use **Random Reporter** to ask:

**What is your team's goal for the next cycle? Why did you choose that goal?**

*Accept supported answers.*

5. Use the poster to award team celebration points for responses that include the team's reasons for choosing the goal, thus beginning the accumulation of points for the next cycle.
6. Have students record their cycle test scores and their areas of greatest strength and improvement on their progress charts.



## Class Council

(30 minutes)

1. Share class compliments.
2. Review the class goal that was set at the last Class Council. Using the agreed-upon measure of progress, was the goal met? Why or why not?
3. Discuss a class concern, or use the scenario and discussion hints provided.
4. Have teams discuss and then use **Random Reporter** to share responses.
5. After debriefing how they resolved the problem, help students set a goal and a measure of progress that they can use at the next Class Council.



## Brain Game

(5 minutes)

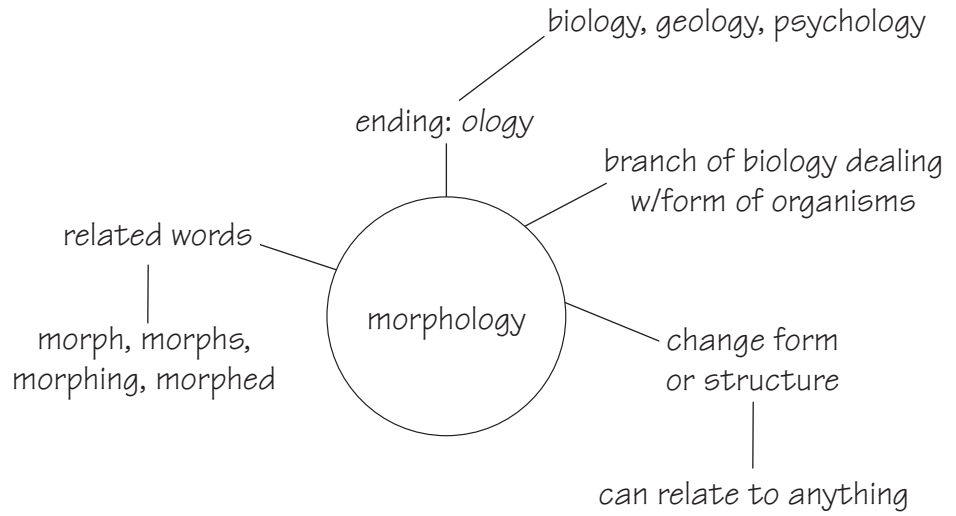
1. Choose a brain game from the card set, and then play the game.
2. Use the following questions to debrief and remind students of self-regulatory strategies:

**What did this game require your brain to do?**

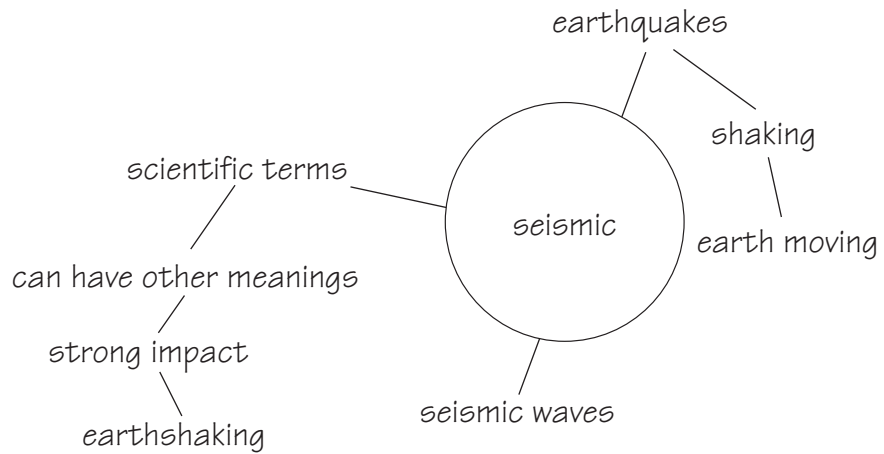
**How will use of this skill improve your success in other classes?**

Word Power Journal Sample Entries

**Sample Word Map  
Cycle 1**



**Sample Word Map  
Cycle 2**



## Common Core State Standards

The following Common Core State Standards are addressed in this unit.

Full program alignments can be found on the Reading Edge online resources.

Contact your SFA coach for more information.

### Level 7 Clarify Words in Science

#### **English Language Arts Standards: Science and Technical Subjects**

##### **Craft and Structure**

**RST.6-8.4.** Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

**RST.6-8.6.** Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

##### **Integration of Knowledge and Ideas**

**RST.6-8.7.** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

**RST.6-8.9.** Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

#### **English Language Arts Standards: Writing in History/Social Studies/Science**

##### **Text Types and Purposes**

**WHST.6-8.2d.** Use precise language and domain-specific vocabulary to inform about or explain the topic.

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