Informational

Analyze a Process

The Frog Scientist

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.
We wish to acknowledge the coaches, teachers, and children who piloted the program, provided valuable feedback, and appear in classroom and professional-development videos.

The Reading Edge Middle Grades 2nd Edition Teacher Edition
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### Analyze a Process

#### The Frog Scientist

- 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.

#### The Lightning Round

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

<table>
<thead>
<tr>
<th><strong>Word Power</strong></th>
<th><strong>Fluency</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>The Random Reporter:</strong></td>
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<tr>
<td><strong>Word Power</strong></td>
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<tr>
<td><strong>The Random Reporter:</strong></td>
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<tr>
<td>100</td>
<td>gives a 90-pt. response and</td>
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<td></td>
<td>expands on the meaning, for example, identifies</td>
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<td></td>
<td>• related words</td>
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<td>• a second meaning</td>
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<td></td>
<td>• a word connotation</td>
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<td>• an antonym</td>
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<tr>
<td>90</td>
<td>gives an 80-pt. response and</td>
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<tr>
<td></td>
<td>explains the meaning in a definition</td>
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<tr>
<td></td>
<td>and a meaningful sentence.</td>
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<tr>
<td>80</td>
<td>tells a word or phrase added to the</td>
</tr>
<tr>
<td></td>
<td>word power journal and why it was</td>
</tr>
<tr>
<td></td>
<td>added (what makes it important or interesting).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Summary</strong></th>
<th><strong>Graphic Organizer/Notes</strong></th>
</tr>
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<tbody>
<tr>
<td><strong>The Random Reporter:</strong></td>
<td></td>
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<tr>
<td></td>
<td></td>
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<tr>
<td><strong>Summary</strong></td>
<td></td>
</tr>
<tr>
<td><strong>The Random Reporter:</strong></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>gives a 90-pt. response and</td>
</tr>
<tr>
<td></td>
<td>uses key vocabulary correctly.</td>
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<tr>
<td>90</td>
<td>gives an 80-pt. response and</td>
</tr>
<tr>
<td></td>
<td>clearly connects relevant ideas in</td>
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<td></td>
<td>a logical order.</td>
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<tr>
<td>80</td>
<td>presents main ideas and important</td>
</tr>
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<td></td>
<td>details in his or her own words and</td>
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<td></td>
<td>without personal opinion.</td>
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<tr>
<td>80</td>
<td>selects a graphic organizer that is</td>
</tr>
<tr>
<td></td>
<td>appropriate for the text.</td>
</tr>
</tbody>
</table>

The Reading Edge Middle Grades • Teacher Edition • Level 6H
Unit Objectives

| Reading: | Analyze and explain a process and its purpose. |
| Writing: | Use information from the text to describe a process or experiment. |

Unit Overview

The reading objective for this unit is primarily applied to the scientific process. Students will use their understanding of the scientific process to identify parts of the text that explain the work of Dr. Tyrone Hayes and his research on frogs.

Science is a repeatable, reliable way to construct knowledge about the natural world. The scientific process, or scientific method, involves:

- making measurable, repeatable observations, or identifying a problem;
- asking a question about the observations or problem;
- forming a hypothesis (based on the observations, questions, or problem)—if I do this, then that will happen; predicting an outcome of the experiment;
- conducting a repeatable experiment using appropriate variables and controls (or making further repeatable observations);
- collecting the results from the experiment (data); and
- drawing a conclusion about what the results tell you about the hypothesis.

Scientists follow a lot of details during this process, most of which are beyond the scope of this book.

The hallmarks of a good scientist are skepticism (the ability to question one’s ideas, beliefs, and conclusions) and open-mindedness—accepting new evidence and being willing to change one’s conclusions or beliefs if the new evidence is compelling.

The book also provides examples of how questions arise from the results of experiments, leading to another experiment, in an almost unending process of observation, testing, data analysis, and drawing conclusions.

Teacher’s Note: Many of the skill questions ask about steps in a process for Team Talk questions, test questions, and writing projects. Please accept variations in the answer format (for example: numbered steps in running text and numbered steps listed in order) so students will have some flexibility in how they present the answer. In all cases, look for the inclusion of all appropriate steps and that they are clear and understandable. One of the points of this skill is to be able to tease out steps from the description of the process or procedure.

Unit Topic/Content

*The Frog Scientist* by Pamela S. Turner tells the story of Dr. Tyrone Hayes and his research into the effects of pesticides on frogs. Turner also follows the path taken by Dr. Hayes to become a Ph.D. researcher.
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

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<th>Media</th>
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<td>pages 1–7</td>
<td>(Embedded) Background video: “Mud Scientist: Laura Triplett” Dragonfly TV (Embedded) “Fluency”</td>
</tr>
<tr>
<td>Lesson 2</td>
<td>pages 9–17 (paragraph 1)</td>
<td>(Embedded) Background video: “Frog Scientist: Tyrone Hayes,” Dragonfly TV</td>
</tr>
<tr>
<td>Lesson 3</td>
<td>pages 17 (paragraph 2)–19</td>
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<tr>
<td>Lesson 4</td>
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<td>self-selected reading</td>
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<tr>
<td>Lesson 8</td>
<td>Getting Along Together</td>
<td></td>
</tr>
</tbody>
</table>
Lesson 1

Reading Objective: Analyze and explain a process and its purpose.

Teacher Background

In this unit, students are introduced to the scientific process by following the work of a frog scientist, Dr. Tyrone Hayes.

You will also discuss the full scientific process. Students will begin identifying problems, observations, and questions about frogs as they read the text.

You will also introduce students to frogs by showing the PBS video “Frozen Frogs.”

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: The title of the book is The Frog Scientist. What is science? What do scientists do? What do you think a frog scientist does?

Set the Stage

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

   The title of the book is The Frog Scientist. What is science? What do scientists do? What do you think a frog scientist does?

   Science is the study of rocks, birds, and things like that. Scientists are people who do science. A frog scientist would study frogs—how they behave, where they live, etc.

2. Build background about the scientific process by showing the video “Mud Scientist: Laura Triplett.” Use Think-Pair-Share to debrief the video.

   What is this mud scientist trying to find out and how is she doing it?

   The mud scientist wants to know how people have affected the environment of the bottle. She is taking mud samples and testing them to see how the mud has changed over time.

   Point out that science is the systematic study of the natural world through observations, questions, and experiments. Explain that a scientific experiment is an organized, logical, repeatable process that tries to answer questions that arise from observations.
3. 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.

T: Frogs, frog scientists
I: To provide information about frogs or the scientists who study them
G: T-chart

Interactive Read Aloud

1. This cycle our reading objective is: analyze and explain a process and its purpose. Explain that the book The Frog Scientist discusses a particular science researcher—Dr. Tyrone Hayes—and his work with frogs. Tell students that as they read, they will learn about his work and the scientific process that he uses to study frogs.

2. Remind students that a process is a series of steps to accomplish a task or goal and that a successful process includes all the steps in the correct sequence. Point out that there are natural processes, like seasons changing, and that there are processes that people use to do things—from the process of making a jelly sandwich to the scientific process of trying to find a cure for cancer, and everything in between.

3. Tell students that there is a specific process for scientific work, sometimes called the scientific process or the scientific method. Refer students to the Scientific Process in their student editions, and review it with them.

Scientific Process

1. Make observations, identify problems, ask questions.
2. Form a hypothesis—the idea an experiment will test, based on the question/observations made; the hypothesis sets up the purpose for an experiment.
3. Conduct a repeatable experiment using appropriate variables (something that is changed) and controls (something held constant).
4. Collect and analyze data—what happened as a result of the experiment.
5. Draw conclusions—look for patterns/connections to the hypothesis. Does the data support the hypothesis? Was the hypothesis prediction correct? What new questions arise? Identify problems with the design of the experiment.

- The data and conclusions from the experiment will raise additional questions or problems that can then be tested experimentally, repeating the scientific process over and over again.
Explain that because science has a specific reliable process that is repeatable, scientists can study problems in a systematic way and that this scientific process also shows that the end of one process leads to another question and another scientific process. Tell students to look for these steps as they read about Dr. Hayes’ work.

4. Read pages 1–3 (ending with paragraph 3) aloud. A sample Think Aloud follows.

<table>
<thead>
<tr>
<th>Sample Think Aloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most of this passage is about catching frogs, but I don’t get to the possible main goal of catching frogs until page 3, with the information at the end of paragraph 1: “…but even in a place like this there can be pesticides that can harm wildlife.” This is a problem. Continuing to paragraph 3, I finally find Tyrone’s question—he wants to find out the effect of pesticides on growing frogs. I had to keep reading to find out the purpose of the book because it isn’t stated at the very beginning. Knowing that a scientific study begins with a problem, question, or observation helps me figure out what Tyrone is trying to do.</td>
</tr>
</tbody>
</table>

5. Use Think-Pair-Share to ask:

Is a text always sequential when presenting details of events? How can you figure out the correct sequence?

No, texts don’t always present event details sequentially. I can use my common sense and time or sequence words, such as first, last, and next.

Why do you think the author begins the book as a description of the people and their actions instead of just giving the steps to catching frogs in the field?

(Answers may vary.) The author’s way is more interesting. By opening the book with the people, you feel more connected to the information and can ask yourself questions, such as “Why are they doing this?” and “Why would anyone get up early and skip breakfast just to catch frogs?”

6. 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 page 4, paragraphs 1–3, and have students add a clarification to Tyrone’s question.

Use Random Reporter to debrief.

Tyrone wants to know if atrazine affects the growth of leopard frogs in Dugway Pond.

What is Tyrone doing to study this problem?

Tyrone and his team are collecting frogs from the pond to study.
7. 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.

<table>
<thead>
<tr>
<th>Observation/Identified Problem/Question</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pesticides can harm wildlife.</td>
<td></td>
</tr>
<tr>
<td>• How do pesticides in environment affect frog growth?</td>
<td>Catch Dugway Pond frogs for study</td>
</tr>
<tr>
<td>• Does atrazine affect growth of leopard frogs in Dugway Pond?</td>
<td></td>
</tr>
</tbody>
</table>

**Teamwork**

(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: *pages 1–7 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.

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 are the advantages to having a healthy frog population? [RE, SA] (Team Talk rubric)

   **100** = One advantage to having a healthy frog population is that they eat many insects. Frogs eat pests like mosquitoes. They also eat earthworms, snails, and spiders. This helps to keep the numbers of these insects from becoming too large and bothering us or other animals or plants in the environment. Frogs are also food for other animals, such as great blue herons, snakes, and foxes. The frog has an important role in the environment.

   **90** = Frogs eat many insects. Frogs are also food for other animals, such as great blue herons.

   **80** = Frogs eat many insects.

2. What are pesticides, and what does Tyrone want to know about them? [RE, SA] (Team Talk rubric)

   **100** = Pesticides are chemicals that kill plants or animals that people think are pests. For example, a pest might be a weed that grows in your garden or a mosquito that bites you, or an insect that eats corn in a farmer's field. Tyrone wants to know if pesticides that are meant to kill other things are also harming growing frogs. As a scientist, Tyrone asks a question about a possible problem in the environment.

   **90** = Pesticides are chemicals that kill plants or animals that people think are pests. A pest might be a weed. Tyrone wants to know if pesticides that are meant to kill other things are harming growing frogs.

   **80** = They kill pests. He wants to know if they hurt frogs.

3. What do you think Tyrone suspects about the impact of pesticides on frogs and humans? [RE, SA] (Team Talk rubric)

   **100** = I think Tyrone suspects that pesticides are harming the frogs. Pesticides are usually spread on farm fields. However, the wind or extra rainwater that runs off the field may carry the chemicals far away. As a result, it becomes hard to control what the chemicals hurt or kill. I think that Tyrone suspects that the pesticides are harming the frogs, and possibly people, or he would not be working so hard to collect lots of frogs and water samples to study.

   **90** = I think Tyrone suspects that pesticides are harming the frogs. Wind or extra rainwater that runs off the field may carry the chemicals far away.

   **80** = He thinks the pesticides are harming the frogs.

continued
Team Talk Questions continued

4. Use the information on pages 4 and 6 for the following questions: Why is Tyrone conducting this experiment—what is its purpose? What are the steps in his process? (Write) [RE] (Team Talk rubric)

100 = Tyrone does this experiment because he wants to know if atrazine affects the development of leopard frogs. The steps in the experiment are: 1. Take frogs from Dugway Pond and keep them safe in the lab. 2. Put 1 drop of atrazine into Dugway Pond. 3. Collect juvenile frogs and developing eggs from the pond water with the pesticide. 4. Count and label all the frogs. Kill them and prepare them for study using a microscope. 5. Compare the frogs from the pond that were collected before the atrazine was added with those that lived in the pond with the atrazine. Doing a logical process will help Tyrone answer his question.

90 = Tyrone does this experiment because he wants to know if atrazine changes the development of leopard frogs. 1. Take frogs from Dugway Pond and keep them in the lab. 2. Put 1 drop of atrazine into the pond. 3. Collect juvenile frogs and developing eggs from the pond water. 4. Count and label all the frogs. Kill them and prepare them for study. 5. Compare the frogs from the pond that were collected before the atrazine was added with those that lived in the pond with the atrazine.

80 = 1. Take frogs from the pond. 2. Put 1 drop of atrazine into the pond. 3. Collect juvenile frogs and developing eggs from the pond water. 4. Count and label all the frogs. 5. Compare the frogs from the pond that were collected before the atrazine was added with those that lived in the pond after.

Class Discussion 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.

3. Show the video “Fluency.”
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.
Scientific Process

1. Make observations, identify problems, ask questions.
2. Form a hypothesis—the idea an experiment will test, based on the question/observations made; the hypothesis sets up the purpose for an experiment.
3. Conduct a repeatable experiment using appropriate variables (something that is changed) and controls (something held constant).
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- The data and conclusions from the experiment will raise additional questions or problems that can then be tested experimentally, repeating the scientific process over and over again.
Lesson 2

**Reading Objective:** Analyze and explain a process and its purpose.

**Teacher Background**
The information on pages 9–11 highlights Tyrone’s journey to a scientific career, and pages 13–17 outline the problem of disappearing amphibians. Students will continue identifying observations and problems affecting frogs.

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**Active Instruction**

**(25 minutes)**

**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.

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Definition</th>
<th>Sample Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>juvenile (adjective)</td>
<td>ju-ve-nile (JOO-veh-nile)</td>
<td>young, not yet an adult</td>
<td>Mother shopped in the juvenile section of the shoe store to find shoes for my 13-year-old sister.</td>
</tr>
<tr>
<td>development (noun)</td>
<td>dev-el-op-ment (deh-VEL-ihp-ment)</td>
<td>growth</td>
<td>We watched the development of the garden and saw plants grow and bloom.</td>
</tr>
<tr>
<td>contaminated (adjective)</td>
<td>con-tam-in-ated (kun-TAM-ih-nay-ted)</td>
<td>dirtied, unclean</td>
<td>Martha would not eat her contaminated lunch after she spilled paint on it.</td>
</tr>
</tbody>
</table>

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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.

continued
<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Definition</th>
<th>Sample Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>sensitive</td>
<td>sen-si-tive</td>
<td>delicate</td>
<td>The flowers are very sensitive to cold temperatures and will die in a frost.</td>
</tr>
<tr>
<td>persistence</td>
<td>per-sis-tence</td>
<td>determination</td>
<td>Brad showed his persistence by practicing his pitching every day so he could try out for the baseball team.</td>
</tr>
<tr>
<td>surveyed</td>
<td>sur-vey-ed</td>
<td>looked over</td>
<td>Becca surveyed the refrigerator, looking for something to eat.</td>
</tr>
<tr>
<td>deformities</td>
<td>de-form-i-ties</td>
<td>defects</td>
<td>Our tree has some deformities, and the limbs have grown at odd angles.</td>
</tr>
<tr>
<td>evacuated</td>
<td>e-vac-u-ated</td>
<td>moved out, removed</td>
<td>The school evacuated all the students during the fire drill.</td>
</tr>
</tbody>
</table>

4. Use **Random Reporter** to have teams share a new sentence that uses one of their vocabulary words. Award team celebration points.

5. 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 text, author, and reading objective.

4. Introduce and show the video “Frog Scientist: Tyrone Hayes.” Use **Think-Pair-Share** to debrief the video.

What new information have you learned about frogs and the work of frog scientists?

(Answers will vary.) For example, I learned that there are 4,000 species of frogs but that many species are becoming endangered. I learned that studying the tadpoles and their development is important because it tells us about the quality of water, and we need clean drinking water.
5. Refer students to today’s reading, pages 9–17 in *The Frog Scientist.* Have students review their graphic organizers.

6. Remind students to use their graphic organizers to note important ideas that they find in the text. Review the graphic organizer that students selected in the previous lesson.

Point out that scientists make notes on what they learn and what they do. A scientist’s lab notebook is very important to him or her. Refer students to the pictures on pages 6, 14 (the golden toad), 29, and 30. Explain that making notes and labeling things is an important aspect of scientific work.

Remind students that they are recording observation, problems, questions, and processes in their graphic organizer and that reviewing these notes will help them identify any patterns that might exist.

**Interactive Read Aloud**

1. Refer students to the reading objective.

2. Read page 11 (last paragraph) and page 13 aloud to add to the observations/problems section of the graphic organizer. A sample Think Aloud follows.

   **Sample Think Aloud**

   OK, here is a really big problem—frogs are dying all over the world. This is a larger problem than what Tyrone has identified so far. Amphibian scientists have found that all sorts of amphibians are declining in number. Something must be going on. I’ll add this to my graphic organizer.

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

   **What do you think the next step in this process should be?**

   *(Answers may vary.)* I would find out if it is really true that the amphibians are disappearing.

   Point out that it may take a lot of observations before scientists can go on to the next step of forming a hypothesis and planning experiments.

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 page 14 (paragraph 1) and finish the process of clarifying the problem of disappearing amphibians.

   Use **Random Reporter** to debrief.

   *(Answers may vary.)* Scientists surveyed amphibian populations around the world. The results of the survey showed that about a third of the amphibian species are threatened with extinction.

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.

<table>
<thead>
<tr>
<th>Observation/Identified Problem/Question</th>
<th>Action</th>
</tr>
</thead>
</table>
| Amphibian populations declining all over the world.  
  - Survey showed that 122 species extinct since 1980 & about 1/3 species currently threatened. | Scientists talked to each other & shared their observations.  
  - Did a survey to confirm observations. |

Point out that scientists gather many observations and much information, often from other scientists.

![Teamwork](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: pages 9–17 (paragraph 1) 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.

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

   (Team Talk rubric)  
   100 = Tyrone almost dropped out of Harvard because he became **discouraged** when he was not able to do real research. He had to take a **job** in a lab cleaning glassware in order to pay for school. When he felt **frustrated**, he let his grades go down. This made him think about dropping out. His girlfriend and one of his professors supported him. His teacher let him do research even though he had poor grades. *When he knew that others had confidence in him, he began to have more confidence in himself.*  
   90 = Tyrone became upset when he was not able to do real research. He let his grades go down. His girlfriend and one of his professors supported him.  
   80 = He was upset when he couldn’t do real research. His girlfriend and a professor helped him.  

2. Explain the process it took for Tyrone to become a frog scientist. [RE]  
   (Team Talk rubric)  
   100 = Tyrone found that his childhood interest led him to a career studying something he liked—frogs. Tyrone liked to tramp around in swamps looking at frogs, snapping turtles, and snakes. His parents **encouraged** his **interest**. He caught and kept frogs and reptiles on his front porch. He did well in high school and decided to have a **career** in science. He went to Harvard. He almost dropped out, but was turned around by his girlfriend and Dr. Waldman. He graduated from Harvard and went to California for graduate school. There is usually a **series** of steps, often starting in childhood, that people take to get to their career.  
   90 = Tyrone wanted to study something he liked—frogs. His parents helped him. He did well in high school and decided to become a scientist. He went to Harvard. He almost dropped out, but was turned around by his girlfriend and Dr. Waldman. He graduated from Harvard and went to California for graduate school.  
   80 = He went to Harvard. He graduated and went to California for graduate school.  

3. What are two problems related to the decline in amphibian populations?  
   (Write) [RE] (Team Talk rubric)  
   100 = According to the text, one problem that frogs are facing is **habitat loss**. The **development** of more housing and shopping centers means that there are fewer places for frogs to live. Some habitat is **fragmented**, or divided into small pieces that are too small to provide enough for frogs. Roads and buildings destroy the forests, ponds, and wetland that frogs need to live. Frogs were also found with deformities. *Frogs cannot survive if they do not have a proper habitat.*  
   90 = Frogs are losing the places where they live. The building of more housing and shopping centers means that there are fewer places for frogs to live. Some frogs have deformities.  
   80 = Frogs are facing the loss of where they live, and they have deformities.  

*continued*
Team Talk Questions continued

4. Why did the amphibian scientists think habitat loss was not the only problem? [RE]
   (Team Talk rubric)
   
   100 = When the amphibian scientists looked carefully at the places where amphibians were disappearing, the places were not only in areas of habitat loss. Amphibians were disappearing from national parks, other protected areas, and rural areas without many people. Frogs were also being found with deformities. The problem of disappearing amphibians was more complicated than just habitat loss.

   90 = When the amphibian scientists looked carefully at the places where amphibians were disappearing, the places were not only in areas of habitat loss. Amphibians were disappearing from national parks and other areas that were supposed to be safe.

   80 = Amphibians were disappearing from places that were supposed to be safe too.

5. What word from the vocabulary list belongs in the blank? How do you know? [CV]

   Tanya ________ the fruit stand to find her favorite apples.
   
   Surveyed. The context of the sentence is that Tanya wants to find her favorite apples. Surveyed means to look over, and in doing this, you may find something.

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 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  
(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.
<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Definition</th>
<th>Sample Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td>juvenile (adjective)</td>
<td>ju‑ve‑nile (JOO‑veh‑nile)</td>
<td>young, not yet an adult</td>
<td>Mother shopped in the <em>juvenile</em> section of the shoe store to find shoes for my 13-year-old sister.</td>
</tr>
<tr>
<td>development (noun)</td>
<td>dev‑el‑op‑ment (deh‑VEL‑ihp‑ment)</td>
<td>growth</td>
<td>We watched the <em>development</em> of the garden and saw plants grow and bloom.</td>
</tr>
<tr>
<td>contaminated (adjective)</td>
<td>con‑tam‑in‑ated (kun‑TAM‑ih‑nay‑ted)</td>
<td>dirtied, unclean</td>
<td>Martha would not eat her <em>contaminated</em> lunch after she spilled paint on it.</td>
</tr>
<tr>
<td>sensitive (adjective)</td>
<td>sen‑si‑tive (SENS‑ih‑tiv)</td>
<td>delicate</td>
<td>The flowers are very <em>sensitive</em> to cold temperatures and will die in a frost.</td>
</tr>
<tr>
<td>persistence (noun)</td>
<td>per‑sis‑tence (per‑SIS‑tense)</td>
<td>determination</td>
<td>Brad showed his <em>persistence</em> by practicing his pitching every day so he could try out for the baseball team.</td>
</tr>
<tr>
<td>surveyed (verb)</td>
<td>sur‑vey‑ed (SIR‑vayd)</td>
<td>looked over</td>
<td>Becca <em>surveyed</em> the refrigerator, looking for something to eat.</td>
</tr>
<tr>
<td>deformities (noun)</td>
<td>de‑form‑i‑ties (deh‑FORM‑ih‑tees)</td>
<td>defects</td>
<td>Our tree has some <em>deformities</em>, and the limbs have grown at odd angles.</td>
</tr>
<tr>
<td>evacuated (verb)</td>
<td>e‑vac‑u‑ated (ee‑VACK‑yoo‑ated)</td>
<td>moved out, removed</td>
<td>The school <em>evacuated</em> all the students during the fire drill.</td>
</tr>
</tbody>
</table>
Lesson 3

Reading Objective: Analyze and explain a process and its purpose.

Teacher Background

Students continue gathering observations, problems, and questions about frogs. This section of the book addresses the multiple problems facing frogs—habitat loss and fragmentation, deformities due to a parasite, chytrid fungal disease, ultraviolet (UV) radiation, introduced species, and additional information about pesticides.

Active Instruction

(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

I want to clarify the word biology on page 1. (Model looking up the word to find its roots). I see that this word has two roots, both Greek: bio-, which means life or alive, and -ology, which means the study of something. So biology means the study of life, or the study of living things.
**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 text, author, and reading objective.
4. Refer students to today’s reading, pages 17 (paragraph 2)–19 in *The Frog Scientist*. 

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**Review Vocabulary Vault.**

**Teams review their cycle goal.**

**Post and present the reading objective.**

Refer students to pages 17 (paragraph 2)–19 in the text.

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**Sample Word Map**

<table>
<thead>
<tr>
<th>Greek roots</th>
<th>Sample Word Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>biology</td>
<td>-ology (study of)</td>
</tr>
<tr>
<td>bio- (life, living)</td>
<td>geology (study of the earth)</td>
</tr>
<tr>
<td>biologist (one who studies living things)</td>
<td>musicology (study of music)</td>
</tr>
<tr>
<td>micro- (study of tiny living things)</td>
<td>zoology (study of animals)</td>
</tr>
<tr>
<td>amphibious (both lives)</td>
<td>meteorology (study of weather)</td>
</tr>
<tr>
<td>antibiotic (against life)</td>
<td>Egyptology (study of Egypt)</td>
</tr>
<tr>
<td>biography (writing about a person’s life)</td>
<td>bacteriology (study of bacteria)</td>
</tr>
<tr>
<td>biochemistry (chemistry of living things)</td>
<td></td>
</tr>
</tbody>
</table>

---

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.
5. Point out that the section of text that they will read today is getting more detailed, and the author pulls together information gathered by different scientists. Explain that each bit of information could play a role in the decline of amphibians.

6. Remind students to use their graphic organizers to note important ideas that they find in the text. Review the graphic organizer that students selected in the previous lesson.

**Interactive Read Aloud**

1. Read page 17 (paragraph 2) aloud. Use Think-Pair-Share to prompt use of the skill or strategy.

   **What additional problem or problems can we add to our graphic organizer?**

   *We can add the chytrid fungus, which kills amphibians, and increases in global temperatures, which seem to help the fungus spread.*

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 next paragraph on page 17 and identify an additional problem or problems.

   Use Random Reporter to debrief.

   *Frogs living at high altitude are threatened by UV radiation caused by a thinning of the ozone layer due to man-made chemicals.*

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.

   **Sample Graphic Organizer**

<table>
<thead>
<tr>
<th>Observation/Identified Problem/Question</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habitat loss &amp; fragmentation reduces places for amphibians to live.</td>
<td>Scientists talked to each other &amp; shared their observations.</td>
</tr>
<tr>
<td>Frog deformities have been seen.</td>
<td>New Zealand scientists have found a chemical that kills fungus, but it is hard to use it in the wild.</td>
</tr>
<tr>
<td>Chytrid fungus kills frogs; seems to be spread by warmer temperatures.</td>
<td></td>
</tr>
<tr>
<td>UV radiation harms frogs.</td>
<td></td>
</tr>
</tbody>
</table>
Teamwork

(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:

   pages 17 (paragraph 2)–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

1. Explain, or review if necessary, how to use role cards and the student routines for strategy use and Team Talk discussion.

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 is the observation that scientists made about ultraviolet light? Explain the steps in the process leading to the impact on frogs living at high altitudes. (Write) [RE] (Team Talk rubric)

   100 = Scientists observed that ultraviolet light harmed frogs living at high altitude. A series of steps have led to this decline. These steps include:
   1. Ozone layer keeps damaging UV rays from reaching us.
   2. Man-made chemicals have thinned the ozone layer.
   3. Air is thinner at high altitudes.
   4. If ozone layer is thinner at high altitudes, more UV reaches the earth.
   5. High levels of UV can kill shell-less frog eggs.
   6. Fewer frogs hatch and frog population falls. This process illustrates that interacting factors can negatively impact an animal species.

   90 = Scientists observed that ultraviolet light harmed frogs living at high altitude.

   80 = They saw that ultraviolet light harmed frogs living at high altitude.

   continued
Team Talk Questions continued

2. Why do you think the author includes information about the red-legged frog in the book? How does this passage relate to the rest of the information that you have read so far? [RE, AP] (Team Talk rubric)

100 = The author includes the passage about the red-legged frog in the book because it is an example of how frogs may be affected by more than one problem. The red-legged frog is negatively impacted by habitat loss, fungal disease, introduced species (bullfrogs and fish), and pesticides. With all of these problems, the red-legged frog is certainly threatened with extinction. So far, the book seems to be addressing the problem of disappearing frogs. The passage about the red-legged frog relates directly to the information in the rest of the book. The red-legged frog serves as a good example of the problems that frogs face in their environment.

90 = The author includes the passage about the red-legged frog in the book because it shows how frogs may be hurt by more than one problem. The red-legged frog is hurt by habitat loss, fungal disease, introduced species (bullfrogs and fish), and pesticides. The passage about the red-legged frog relates directly to the information in the rest of the book.

80 = It is an example of how frogs may be hurt by more than one problem. It relates directly to the rest of the book.

3. What is an introduced species? What is the impact of introduced species and pesticides on frogs? Support your answer with evidence from the text. [RE] (Team Talk rubric)

100 = Introduced species and pesticides are harmful to frogs. An introduced species is a plant or animal that is found someplace that it doesn’t usually live. They can eat the food that native things used to eat. They can take habitat away from smaller or weaker native species. These things can make it hard for the native species to survive. Pesticides make frogs more vulnerable to other harmful factors. Pesticides can also cause deformities, both obvious and hidden, in frogs. When Tyrone tested frogs exposed to atrazine, he found hidden deformities in them. Introduced species and pesticides are two additional problems facing frogs.

90 = Introduced species and pesticides are dangerous to frogs. An introduced species is an animal that is found someplace that it doesn’t usually live. Pesticides can also cause deformities.

80 = They are dangerous to frogs. An introduced species is an animal that is found someplace that it doesn’t usually live.

4. How are the leg deformities caused in frogs? [MI] (Team Talk rubric)

100 = The leg deformities in frogs are caused by a parasitic worm. The worm burrows under the skin of tadpoles and interferes with normal growth in the tadpole. Sometimes the parasite prevents a leg from growing, and sometimes it causes legs to be deformed. Parasites are harmful to frogs.

90 = The leg deformities in frogs are caused by a parasite. The worm goes under the skin of tadpoles and messes up their normal growth.

80 = They are caused by a parasite.

continued
5. Which of the following is NOT an example of something that is contaminated? [CV]
   - A. dyed water
   - B. pure water
   - C. trashy water
   - D. brown water

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 (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:** Analyze and explain a process and its purpose.

**Teacher Background**

Students continue gathering observations, problems, and questions about frogs. In this section, the author describes a particular incident that happened to frogs living in the La Valle region of Panama and how scientists responded to the problem.

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**Active Instruction**

(25 minutes)

**Partner Vocabulary Study**

1. Display the vocabulary words. Have students use the vocabulary study routine as they rate 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 text, author, and reading objective.
4. Refer students to today’s reading, pages 20 and 21 in *The Frog Scientist.*
5. Remind students to use their graphic organizers to note important ideas that they find in the text. Review the graphic organizer that students selected in the previous lesson.
Interactive Read Aloud

1. Read paragraph 2 aloud. Use Think-Pair-Share to prompt use of the skill or strategy.

What is the problem in this passage?

The problem is that the chytrid fungus is spreading to the La Valle region of Panama and threatens to wipe out the frogs there.

What process was used as an immediate solution? What is its purpose? Use numbered steps.

The purpose of the process is to save endangered frogs in Panama.

1. The Panamanian government asked scientists from the Atlanta Botanical Garden and Zoo Atlanta to come to Panama.

2. They caught several hundred of the rare frogs, including frogs in about thirty rare species.

3. They put the frogs in plastic deli cups with air holes and lined with damp moss.

4. They flew them to Atlanta for a captive breeding program.

Point out that the section of text that students will read today is about another aspect of frogs and other scientists working with frogs—this work is not directly related to the work of Dr. Hayes. Tell students that they can use a sequence chain because there are several sequence words in the text. Point out that the text describes a problem and a process used to solve it.

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.

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.
4. Refer to the reread and review step of the TIGRRS process. Reread paragraph 2 on page 20 aloud. Model this step with the text. A sample Think Aloud follows.

**Sample Think Aloud**

On rereading this passage, it seems that the scientists came up with an idea about how to save frogs in Panama from the spreading fungus. If a large number of frogs are caught and removed from the spread of a disease and then bred in captivity, then the rare frogs will be saved. So the scientists caught a lot of frogs, put them in deli cups, and flew them to Atlanta for captive breeding.
Teamwork

(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: pages 20 and 21 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.

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.

<table>
<thead>
<tr>
<th>Team Talk Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What section of text did you choose to reread and why? What new connection did you make by rereading and reviewing your notes? (Answers will vary.) I reread the last two paragraphs on page 21. I wasn’t clear about the role played by the Amphibian Ark outside of Panama. Upon rereading, I got the point of the motto of the Amphibian Ark.</td>
</tr>
<tr>
<td>2. Summarize the section of text that you reread. (Write) [MI] (summary rubric) (Answers will vary.) The Amphibian Ark also worked to save the Houston toad from habitat loss and drought. Due to the captive breeding program for this toad, a thousand juvenile toads were released back into the wild.</td>
</tr>
</tbody>
</table>

continued
3. How did the Houston Zoo in Texas help the El Valle frogs? What problem did the zoo staff encounter while helping the frogs, and what steps did they take to solve the problem? (Write) [RE] (Team Talk rubric)

100 = The Houston Zoo helped people in Panama build their own captive breeding facility. If Panama could breed the frogs in captivity, maybe the frogs would be saved from extinction. Before the construction on the breeding facility was finished, people were finding dead frogs. The steps they took to solve the problem were to 1) quickly collect about 300 frogs and 2) keep them in two hotel rooms until the facility was finished. It is always a good idea to have a backup plan to compensate for changes that might happen. If the Houston Zoo staff had not rescued the frogs when they did, they would have lost many frogs to the chytrid fungus.

90 = The Houston Zoo helped people in Panama build their own captive breeding facility. If Panama could breed the frogs in captivity, maybe the frogs would be saved from extinction. Before the construction on the breeding facility was finished, people were finding dead frogs. The steps they took to solve the problem were to 1) quickly collect about 300 frogs and 2) keep them in two hotel rooms until the facility was finished.

80 = They helped people in Panama build their own place for frogs. Before it was finished, they were finding dead frogs. They collected frogs and kept them in a hotel.

4. What is the goal of the Amphibian Ark, and who is involved in it? [MI] (Team Talk rubric)

100 = The goal of the Amphibian Ark is to save threatened amphibians. Many species of frogs will be lost if something isn’t done to save them. The Atlanta Botanical Garden, Zoo Atlanta, Houston Zoo, and El Valle Amphibian Rescue Center are involved in the Amphibian Ark. There are probably many other organizations and scientists involved too. When a serious problem is identified, many groups and individuals come together to help solve the problem.

90 = The goal of the Amphibian Ark is to save threatened amphibians. Many kinds of frogs will be lost if something isn’t done to save them. The Atlanta Botanical Garden, Zoo Atlanta, Houston Zoo, and El Valle Amphibian Rescue Center are involved in the Amphibian Ark.

80 = The goal is to save amphibians. The Atlanta Botanical Garden, Zoo Atlanta, Houston Zoo, and El Valle Amphibian Rescue Center are involved.

5. 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: My baby sister is very sensitive to loud noises, so we try to be quiet when she is around.

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 (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 information from the text to describe a process or experiment.

**Teacher Background**

Students use the information in the text to explain a process.

**Active Instruction**

(10 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. 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 text, author, and writing objective.

4. Point out that *The Frog Scientist* describes the process that Dr. Tyrone Hayes and others use to solve a problem, and that this is a good example of how science works. Explain that clarifying the steps of a process helps readers understand the text. Also point out that reading and writing about processes explained in the book is similar to doing science experiments in science class.
5. Refer students to the following writing prompt in their student editions. Read the writing prompt aloud.

<table>
<thead>
<tr>
<th>Writing Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the big idea behind the Amphibian Ark project? What steps did the Amphibian Ark organization take to save the frogs? Do you think it will solve the amphibian crisis? Use evidence from the text to support your answer. Refer to pages 20 and 21 in <em>The Frog Scientist</em>.</td>
</tr>
</tbody>
</table>

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 it asks a direct question and asks me to describe the steps in a process.

6. 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.

<table>
<thead>
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<tr>
<td>• Develop the topic with relevant details.</td>
</tr>
<tr>
<td>Organization</td>
</tr>
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<td>• Begin by introducing the topic.</td>
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<td>• In the middle, provide facts, examples, or events that help a reader understand the information.</td>
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<tr>
<td>Mechanics</td>
</tr>
<tr>
<td>• Use correct punctuation, capitalization, spelling, and grammar.</td>
</tr>
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</table>

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: use information from the text to describe a process or experiment?

Under ideas, develop the topic with relevant details relates to the objective. Also under organization, provide facts, examples, or events to help a reader understand the information. Under style, include details or examples that help a reader make a mind movie also relates to the writing objective.

7. 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

1. Remind students that a process is active, and that they need to focus on verbs (action words) to describe it in writing.

   Explain that steps in a process often start with a verb because the subject is assumed to be “the reader” or “you.” Give a common example, such as “Take out the trash,” which is abbreviated from “You take out the trash.”

2. Refer students to pages 4 and 6 in the text. Remind them of the steps describing Tyrone’s experiment at Dugway Pond:

   1. Take frogs from Dugway Pond and keep them safe in the lab.
   2. Put 1 drop of atrazine into Dugway Pond.
   3. Collect juvenile frogs and developing eggs from the pond water with the pesticide.
   4. Count and label all the frogs. Kill them and prepare them for study using a microscope.
   5. Compare the frogs from the pond that were collected before the atrazine was added with those that lived in the pond with the atrazine.

3. Have teams identify the verbs in each step of the experiment. Use Random Reporter to debrief.

   1. take, keep  2. put  3. collect  4. count, label, kill, prepare  5. compare

   Explain that process steps do not always need to begin with a verb, but looking for verbs and using verbs will help them understand and write about a process.

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.
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—use information from the text to describe a process or experiment.

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 all the steps in the process?
- 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.*

**How did your graphic organizer help you in prewriting?**

*Answers will vary.*
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

What is the big idea behind the Amphibian Ark project? What steps did the Amphibian Ark organization take to save the frogs? Do you think it will solve the amphibian crisis? Use evidence from the text to support your answer. Refer to pages 20 and 21 in *The Frog Scientist*.

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</table>
Teacher Background

Today's reading describes some of Tyrone's work with the pesticide atrazine. Atrazine is an herbicide that kills weeds in corn and sugarcane fields.

Biology background:

The endocrine system is the system of glands that produce hormones, and includes the pituitary, thyroid, parathyroid, pancreas, adrenal glands, ovaries, and testes.

Hormones are chemicals that affect other glands and tissues in the body by regulating cell function. Hormones are produced in small amounts by the various endocrine glands, and are carried in the blood stream from the gland to the target tissue. Examples of hormones include:

- human growth hormone (pituitary; regulates growth)
- thyroxin (thyroid; regulates metabolism)
- parathyroid hormone (parathyroid; regulates calcium and phosphorous use)
- insulin (pancreas; regulates uptake of glucose by cells)
- estrogen (ovaries; female sex hormone, regulates menstrual cycle and growth of female secondary sex characteristics)
- testosterone (testes; male sex hormone, regulates growth of male secondary sex characteristics, and maintains male sexual function)

Disruptions in hormone production lead to malfunction; for example, insufficient production of insulin causes diabetes, and insufficient production of thyroxin causes goiter and slows metabolism.

Active Instruction

(5 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.

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 text, author, 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**

(5 minutes)

**Partner Review**

1. Remind students that they have been practicing analyzing and explaining a process and its purpose, and using information from the text to describe a process or experiment. Remind students that they have read about processes in *The Frog Scientist*. Use Think-Pair-Share to have students review the basic science process.

   1. Hypothesis. 2. Conduct a repeatable experiment using appropriate variables (something that is changed) and controls (something held constant). 3. Collect and analyze data—what happened as a result of the experiment. 4. Draw conclusions.

   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 #4 ask about analyzing steps in a process.

4. Ask students to identify key words or phrases in question #4.

   4. What are the steps in the process for the development of a frog from egg to adult frog? [RE]

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 more about Dr. Tyrone Hayes and his work.**
Test (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 (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.

Class Discussion (10 minutes)

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

What is the purpose of the experiment that Tyrone did for Syngenta?
To see if atrazine affects frogs.

How did Tyrone test atrazine? What steps did he use?
Tyrone used African clawed frogs to set up an experiment in his lab. First, some of the frogs were raised in clean water, and some of the frogs were raised in water with atrazine in it. Next, Tyrone observed all the frogs carefully to see if there were any differences between the two groups. He did not see any differences.

Next, he killed some of each group, dissected them, and looked at their tissues with a microscope. He found differences in how the frogs were developing on the inside. He recorded his observations, and then asked more questions and made more hypotheses.
Why did Tyrone run tests on both the African clawed frog and the leopard frog?

He ran tests on two kinds of frogs because he thought one explanation for the abnormalities might be explained by a sensitivity to atrazine on the part of the African clawed frogs.

Point out that their reading today is a good example of the fact that scientific investigation is rarely completed in one experiment—the results of one experiment raise additional questions. Tyrone could spend many years tracking down the specific effect that atrazine has on wildlife.

If you were Tyrone, what other questions would you ask?

Answers will vary.

Tell students to add information from today’s reading to their graphic organizers. Remind students that they have been recording observations, problems, and questions in the first column. Point out that they should highlight other words from the scientific process (hypothesis, experiment, data analysis, and conclusion) as these words occur under the “Action” column to show that they correspond to the observations, problems, and questions in the first step.

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.
Part I. Comprehension (100 points)

1. What is the topic?

   The topic is Tyrone's experimental work. 

   What is the author's intent?

   The author's intent is to explain how Tyrone studied the effects of atrazine on frogs.

   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]

   20 points = Tyrone believes it is important to study the effects of atrazine because it is so widely used on crops. The company that makes atrazine (Syngenta) hired Tyrone to run experiments to test the effects of atrazine. Tyrone compared frogs raised in clean water with those raised in water with atrazine; he found that the frogs raised with atrazine had abnormalities. When Syngenta refused to let Tyrone publish his results, he quit and ran the same experiments again; he got the same results. Tyrone's next step was to see if atrazine had the same effect on frogs in the wild.

   15 points = Tyrone believes it is important to study the effects of atrazine because it is so widely used on crops. The company that makes atrazine (Syngenta) hired Tyrone to run experiments to test the effects of atrazine. Tyrone compared frogs raised in clean water with those raised in water with atrazine; he found that the frogs raised with atrazine had abnormalities.

   10 points = Tyrone believes it is important to study the effects of atrazine because it is so widely used on crops. The company that makes atrazine (Syngenta) hired Tyrone to run experiments to test the effects of atrazine. Tyrone compared frogs raised in clean water with those raised in water with atrazine.

2. What are the steps in the process that Tyrone used to experiment with the fifty frogs that he caught at Dugway Pond? [RE]

   20 points = Tyrone's question/purpose for the experiment: Does the pesticide atrazine affect the development of leopard frogs? To answer this question, Tyrone followed this scientific process: 1. Test pond water for atrazine. 2. Collect clutches of frog eggs to raise in lab. 3. Add 1 drop of atrazine to pond water. 4. Catch the young frogs that grew in the pond with atrazine. 5. Compare male frogs that
grew in atrazine with Dugway frogs raised in the lab. Tyrone followed a series of steps to do his experiment.

15 points = Does pesticide atrazine affect the growth of leopard frogs? 1. Test pond water for atrazine. 2. Collect clutches of frog eggs to raise in lab. 3. Add 1 drop of atrazine to pond water. 4. Compare male frogs that grew in atrazine with frogs raised in the lab.

10 points = 1. Test pond water. 2. Collect clutches of frog eggs. 3. Add 1 drop of atrazine to pond water. 4. Compare male frogs that grew in atrazine with frogs raised in the lab.

3. Why does Tyrone believe it is important to know if atrazine is safe to use? [MI, RE, AP]

20 points = It is important to know if it is safe to use atrazine because it is used widely to help grow crops such as corn. Every year, 75 million pounds of atrazine is used on fields, mostly in the spring, in the United States. When it rains on those fields, rainwater with the pesticide in it runs off into streams and ponds. This chemical finds its way into food chains and into our drinking water. Therefore, it is important to know what this pesticide does to living things.

15 points = It is important to know if it is safe to use atrazine because it is used widely to help grow crops such as corn. Seventy-five million pounds of atrazine is used on fields, mostly in the spring, in the United States.

10 points = It is important to know if it is safe because it is used on crops.

4. What are the steps in the process for the development of a frog from egg to adult frog? [RE]

20 points = Purpose: growth and development of frogs. To grow into adults, frogs: 1. Springtime—female frogs lays clutches of eggs. 2. Eggs develop into tadpoles. 3. Tadpoles develop hind legs. 4. Tadpole turns into a juvenile frog—reabsorbs its tail, front legs appear, gills replaced by lungs. 5. Juvenile frog can hop and move to new places, start the cycle again next spring. The process of development in frogs goes through a series of steps.

15 points = Purpose: growth and development of frogs. 1. Springtime—female frogs lays clutches of eggs. 2. Eggs develop into tadpoles. 3. Tadpoles develop hind legs. 4. Tadpole turns into a juvenile frog—reabsorbs its tail, front legs appear, gills replaced by lungs.

10 points = 1. Springtime—female frogs lays clutches of eggs. 2. Eggs develop into tadpoles. 3. Tadpoles develop hind legs. 4. Tadpole turns into a juvenile frog.
5. What are hormones, and what do they do? [MI, RE, AP]

20 points = Hormones are like chemical switches. They are chemicals found in the bodies of animals and humans. They control development during the lifetime of a living thing. For example, hormones control how a frog changes from an egg to a tadpole and then to an adult frog. In humans, hormones help to turn boys and girls into men and women. Hormones are very important to growth and development.

15 points = Hormones are like chemical switches. They control growth during the lifetime of a living thing. In humans, hormones help to turn boys and girls into men and women.

10 points = They control growth in an animal.

Part II. Writing (100 points)

Write at least a paragraph to answer the following question:

What steps did Tyrone use in the experiments that he did for Syngenta? [RE]

Syngenta hired Tyrone to test atrazine on frogs. Tyrone used African clawed frogs to set up an experiment in his lab. First, some of the frogs were raised in clean water and some of the frogs were raised in water with atrazine in it. Next, Tyrone observed all the frogs carefully to see if there were any differences between the two groups. He did not see any differences.

Next, he killed some of each group and dissected them, and looked at their tissues with a microscope. He found differences in how the frogs were developing on the inside. He recorded his observations, and then asked more questions and made more hypotheses.

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

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</table>
Part III. Vocabulary (100 points)

1. Which of the following is NOT an example of something that is *juveniles*? Explain why. [CV]
   
   A. caterpillar
   B. infant
   C. chick
   D. butterfly

   I know *juveniles* means a young animal, not an adult. All the answer choices except D are young animals.

2. “But many male frogs raised in atrazine-contaminated water were deformed.” In this sentence, the word *contaminated* most nearly means— [CV]
   
   A. supportive.
   B. healthy.
   C. dirtied.
   D. cured.

3. Write a meaningful sentence using the word *surveyed*. [CV]

   Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: I surveyed my test paper to make sure I answered the questions correctly.

4. With Jack's ________, he eventually solved the puzzle. Choose the word that belongs in the blank. [CV]
   
   A. persistence
   B. running about
   C. hurrying
   D. giving up

5. “Frogs are really sensitive to chemicals in the water,” explains Tyrone.” In this sentence, the word *sensitive* most nearly means— [CV]
   
   A. hardy.
   B. tough.
   C. delicate.
   D. firm.

6. Write a meaningful sentence using the word *evacuated*. [CV]

   Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: Before the forest fire got too close, all the campers were evacuated from the park.
7. American curl cats have ________ in their ears that cause the ears to twist to the side, but many people think the cats are cute. Choose the word that belongs in the blank. [CV]
   A. fur
   B. defects
   C. skin
   D. ticks

8. Which of the following is NOT an example of development? Explain why. [CV]
   A. sand on a beach
   B. a butterfly coming from a chrysalis
   C. a vine creeping up a tree
   D. buying larger shoes

   Answers B, C, and D are all examples of growth and change, and that is development.

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]

   We explored the word facility. Facility means establishment or building. The new community facility had ping pong tables, a library, and a nurse’s office.

10. As used in the passage “Australia had a remarkable species called the gastric brooding frog. The mother frog swallowed her eggs and hatched her babies in her stomach,” gastric most nearly means— [CV]
    A. nest.
    B. home.
    C. gills.
    D. stomach.

   Explain how you figured out the meaning of gastric.

   Students will explain their thinking. For example, I continued reading. The next sentence describes what gastric brooding means—brooding the eggs in the stomach.

**Question Codes**

| [SA] Support an answer; cite supporting evidence. | [AP] Identify author’s intent or purpose. |
| [MI] Identify the main idea that is stated or implied. | [RE] Analyze relationships (ideas, story elements, text structures). |
| [CV] Clarify vocabulary. | [AC] Author’s craft; literary devices |
Lesson 7

Reading Objective: Analyze and explain a process and its purpose.

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.
Teamwork
(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.

Read and Respond Questions

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>1.</td>
<td>Is your selection informational or literature? Summarize your reading. (summary rubric)</td>
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<tr>
<td>2.</td>
<td>Why did you choose this reading? What is your purpose for reading? (Team Talk rubric)</td>
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<tr>
<td>3.</td>
<td>Choose a word, phrase, or passage that you did not understand at first. How did you figure it out? (strategy-use rubric)</td>
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<tr>
<td>4.</td>
<td>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)</td>
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<tr>
<td>5.</td>
<td>Would you recommend this selection to others to read? State your opinion, and support it with reasons. (Team Talk rubric)</td>
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<tr>
<td>6.</td>
<td>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)</td>
</tr>
</tbody>
</table>
Class Discussion (15 minutes)

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.

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.
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?

   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.

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**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.

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**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?**
Lesson 1

**Reading Objective:** Analyze and explain a process and its purpose.

**Teacher Background**
In this reading, students will learn additional details about the scientific process: hypotheses, variables (manipulated and responding), and control groups.

**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:** Think about a current issue that affects your neighborhood or one that you have heard about elsewhere. What is the problem, and what is its impact on the environment? How might you help correct this problem?

**Set the Stage**
1. Refer students to today's Big Question. Use Think-Pair-Share to ask:

   *Think about a current issue that affects your neighborhood or one that you have heard about elsewhere. What is the problem and what is its impact on the environment? How might you help correct this problem?*

   *(Answers may vary.) I'm concerned about the loss of forest for birds. When I was little, there were more trees in my neighborhood, and we had a lot of birds. Now there are fewer trees and fewer birds.*

   *What can you do about this problem?*

   *(Answers may vary.) I can try to plant more trees and get my neighbors to plant trees too.*

2. Ask students to review their cycle goal. Remind students how to earn team celebration points. Remind them that team celebration points help them to become super teams. Tell them that they can earn team celebration points during the Lightning Round.

3. Introduce the text, author, 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:**  The work of Dr. Hayes on frogs
   **I:**  To explain the work of Dr. Hayes
   **G:**  T-chart

**Interactive Read Aloud**

1. Refer to the reading objective, and review the skill if necessary.

2. Have students review their graphic organizers from cycle 1. Remind students that making observations and asking questions about them and/or identifying problems is an important part of the scientific process. Explain that once a specific question or problem has been identified, scientists do experiments to test a hypothesis.

3. Read page 31 (paragraphs 6 and 7) aloud. Use Think-Pair-Share to prompt use of the skill or strategy.

   **Summarize the general set-up of an experiment.**

   *Scientific experiments begin with a hypothesis—the idea that the experiment will test. Experiments have manipulated variables, or something in the experiment that is changed, and a responding variable, or a measurable factor that changes in response to the manipulated variable.*

   **What is Tyrone’s hypothesis?**

   *If frogs are raised in water contaminated with atrazine, then many male frogs will be feminized.*

   **What are the manipulated variable and responding variable in Tyrone’s experiment?**

   *The manipulated variable is the water; the responding variable is the male frogs.*

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 page 31, paragraph 8 (continued to page 32). Have students define a control group and identify what the control group is in Tyrone's experiment.

   Use Random Reporter to debrief.

   *A control group is a treatment set that does not have the manipulated variable. In Tyrone’s experiment, the control group is a group of frogs that are raised in plain water and are not exposed to atrazine.*
Partner pairs: Review, reread to clarify, and add to the graphic organizer.

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.

<table>
<thead>
<tr>
<th>Sample Graphic Organizer</th>
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<tbody>
<tr>
<td><strong>The scientific process:</strong></td>
</tr>
<tr>
<td><strong>Observation/Identified Problem/Question</strong></td>
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<tr>
<td>How to do an experiment?</td>
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</tbody>
</table>

Tyrone’s experiment:

• Make the **hypothesis**: If frogs are raised in water contaminated with atrazine, then many male frogs will be feminized.
• Choose the **manipulated variable**: the water with atrazine.
• Choose the **responding variable**: the male frogs.
• Compare control group frogs with manipulated variable group frogs to see if there are any differences.
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: pages 28–33 (paragraph 3) 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.

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. Describe the process that Tyrone’s research assistants use to take care of the frogs. (Write) [RE] (Team Talk rubric)

100 = To take care of the frogs, the research assistants follow this process:
1. They check the frogs in their plastic bins. 2. They catch the tadpoles in plastic deli cups so they can change the water in the bins. 3. To keep things from getting mixed up, each bin of frogs is color coded, and so is its related equipment. Following the process keeps the frogs cared for and separated by group.

90 = To take care of the frogs, they follow these steps: 1. They check the frogs in their plastic bins. 2. They catch the tadpoles in plastic deli cups so they can change the water in the bins. 3. To keep things from getting mixed up, each bin of frogs is color coded.

80 = To take care of the frogs, they follow these steps: 1. They check the frogs in their plastic bins. 2. They catch the tadpoles in plastic deli cups. 3. Each bin of frogs is color coded.

continued
2. What are the connotations of the words clean and contaminated in the sentence, “Some are raised in clean water and some in water contaminated with atrazine” on page 31? If you didn’t know the results of Tyrone’s work, what would your conclusion be about the water with atrazine in it? [AC, DC, AP] (Team Talk rubric)

100 = Clean means not contaminated. Clean water would be healthy water. Contaminated means dirtied or polluted with something. If I didn’t know the results of Tyrone’s work, I would conclude that atrazine-contaminated water is polluted with atrazine and probably harmful to living things. You must consider the connotations of words to understand the meaning of the text and the author’s intent.

90 = Clean means not contaminated. Clean water would be healthy water. Contaminated means dirtied or polluted with something. If I didn’t know the results of Tyrone’s work, I would think that atrazine-contaminated water is probably not good for living things.

80 = Clean means not contaminated. Contaminated means dirty. If I didn’t know the results of his work, I would think that atrazine-contaminated water is dirty.

3. What is a blind experiment? [MI] (Team Talk rubric)

100 = In a blind experiment, the research assistants do not know which frogs are the treatment frogs (living in atrazine-containing water) and which are the control group (frogs living in clean water). That way, they cannot influence the results of the experiment. A blind experiment is another way to keep all the variables constant except for the one being tested.

90 = In a blind experiment, the research assistants do not know which frogs are the treatment frogs and which are the control group (frogs living in clean water).

80 = They do not know which frogs are the treatment frogs and which are the control group.

4. What parts does every scientific experiment need to have in order to produce useful information? [RE] (Team Talk rubric)

100 = Every experiment must compare two things. It must be a fair test, so you must keep everything the same except for one thing that you want to learn about. In this case, everything about how the tadpoles were kept was the same except for the water—half had atrazine and half did not. This way, the scientists know that it had to be the atrazine that caused any differences in the two groups of tadpoles. Scientists follow a certain process to find useful information.

90 = Every experiment must compare two things. It must be a fair test, so you must keep everything the same except for one thing that you want to learn about. Here, everything about how the tadpoles were kept was the same except for the water.

80 = Every experiment must compare two things. Everything must be the same except for one thing.
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.

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**Class Discussion (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:** Analyze and explain a process and its purpose.

**Teacher Background**
Additional information is provided about Tyrone and his team. A flow chart summarizes Tyrone’s experiment.

**Active Instruction**

(25 minutes)

**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.

<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Definition</th>
<th>Sample Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>science</strong></td>
<td>sci-ence (SI-ence)</td>
<td>systematic study of the natural world</td>
<td>My uncle studies the <strong>science</strong> of hurricanes to help people plan for these big storms.</td>
</tr>
<tr>
<td><strong>hypothesis</strong></td>
<td>hy-po-th-e-sis</td>
<td>informed prediction</td>
<td>My <strong>hypothesis</strong> is that I left my book in my math class, so I will go and see if it is there.</td>
</tr>
<tr>
<td><strong>variable</strong></td>
<td>var-i-able (VAR-e-ah-bl)</td>
<td>something that changes</td>
<td>The <strong>variable</strong> in Jane’s plan for the party is the weather since it might change suddenly.</td>
</tr>
<tr>
<td>Word</td>
<td>Pronunciation</td>
<td>Definition</td>
<td>Sample Sentence</td>
</tr>
<tr>
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<tr>
<td>reliable</td>
<td>re-li-able</td>
<td>dependable</td>
<td>Jamie is very reliable, and I can depend on him to take the trash out every week.</td>
</tr>
<tr>
<td>analyzed</td>
<td>an-a-lyz-ed</td>
<td>examined</td>
<td>When my math teacher analyzed my answer, she found that I had made a mistake in step 3.</td>
</tr>
<tr>
<td>embedded</td>
<td>em-bed-ded</td>
<td>set in, buried in</td>
<td>The fence post was embedded in concrete to keep it stable.</td>
</tr>
<tr>
<td>prudence</td>
<td>pru-dence</td>
<td>caution</td>
<td>Claire's prudence made her regularly back up her computer files.</td>
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<tr>
<td>debate</td>
<td>de-bate</td>
<td>discussion</td>
<td>In the debate over what to eat for lunch, Mom suggested tomato soup and a ham sandwich, but Jason wanted ice cream.</td>
</tr>
</tbody>
</table>

4. Use **Random Reporter** to have teams share a new sentence that uses one of their vocabulary words. Award team celebration points.

5. 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 text, author, and reading objective. Have students review their graphic organizers.
Interactive Read Aloud

1. Point out that page 37 has an example of a flow chart—the sequence of steps is indicated by arrows—and that a flow chart is a visual way to summarize steps in a process. Read the experimental process (indicated by yellow arrows) aloud. Use **Think-Pair-Share** to prompt use of the skill or strategy.

   **What is the purpose of the different-colored arrows in the flow chart?**

   *The different-colored arrows indicate different parts of the experiment: yellow is the experiment done in the field, blue is the manipulated variable part of the experiment done in the lab, and red is the control group.*

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 “blue” part of the experiment.

   **Why do all the arrows lead to the same place?**

   *The arrows point to Tyrone looking in the microscope because he examines the tissues from frogs in each of the three groups to see if there are any differences.*

   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.

<table>
<thead>
<tr>
<th>Sample Graphic Organizer</th>
</tr>
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<tbody>
<tr>
<td><strong>Observation/ Identified Problem/Question</strong></td>
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<tr>
<td>Tyrone’s experiment #2:</td>
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**Teamwork**

(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: **pages 33 (paragraph 4)–37 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.

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 is the author’s purpose in including the information about Jasmin on pages 33 and 35? How does it relate to the rest of the book? **[AP]**

   (Team Talk rubric)

   **(Accept supported answers.)**

   100 = *I think the author includes information about Jasmin because her story is similar to Tyrone’s. Jasmin was struggling in college until she took a class from Tyrone. Tyrone helped her, as he was helped by his professor, by letting her work in his lab. Similar to Tyrone’s experience, Jasmin gained confidence, and then she was able to see herself as a medical student. Both Tyrone’s and Jasmin’s personal stories are examples of how students can turn themselves around with a little help.*

   90 = *I think the author includes information about Jasmin because her story is similar to Tyrone’s. Jasmin was struggling in college until she took a class from Tyrone.*

   80 = *Her story is similar to Tyrone’s.*

*continued*
2. What is the author's purpose in including the flow chart on page 37? How does it relate to the rest of the text? [AP] (Team Talk rubric)

100 = The author includes the experiment flow chart to visually explain the steps that Tyrone followed in his experiments. There were three parts of the larger experiment—what happened to the frogs from Dugway Pond, frogs raised in the lab in atrazine-contaminated water, and the control frogs (raised in plain water). All three of these parallel experiments ended with Tyrone examining the tissues from male frogs to determine if any feminization occurred. This flow chart relates to the rest of the text because it is the main experiment that Tyrone did. All the information before this leads up to this experiment. The author has a consistent thread through the book.

90 = The author includes the experiment flow chart to show the steps that Tyrone followed in his experiments. There were three parts of the larger experiment—what happened to the frogs from Dugway Pond, frogs raised in the lab in atrazine-contaminated water, and the control frogs (raised in plain water). This flow chart relates to the rest of the text because it is the main experiment that Tyrone did.

80 = She includes the flow chart to show the steps that he followed. It relates to the rest of the text because it is the main experiment that he did.

3. Describe how Tyrone designed his experiment to make sure that it was a fair test. [RE] (Team Talk rubric)

100 = Tyrone's experiment was a blind experiment. This means that only Tyrone knew which group of frogs lived in atrazine and which group did not. This helped to ensure that no one else in the lab could change the results by accident or on purpose. He also had a control group, the frogs that grew without atrazine. He could compare the frogs exposed to atrazine with these frogs to detect any differences. The diagram on page 37 shows that he had frogs in atrazine in the wild and in the lab to see if their location made a difference. All of these things helped to make it a fair test.

90 = Tyrone's experiment was a blind experiment. This means that only Tyrone knew which group of frogs lived in atrazine and which group did not. He had a control group. Page 37 shows that he had frogs in atrazine in the wild and in the lab to see if their location made a difference.

80 = Tyrone's experiment was a blind experiment. He also had a control group.
Team Talk Questions continued

4. Describe the steps in the red part of the flow chart. If the results of Tyrone’s experiment support his hypothesis, what results should he see? (Write) [RE] (Team Talk rubric)

100 = 1. Wild leopard frog eggs are collected at Dugway Pond and taken back to Tyrone’s lab. 2. Some eggs are raised in plain water. This is the control group. 3. Tissues from male frogs are examined for feminization. If the results of Tyrone’s experiment support his hypothesis, he should see feminization of frogs in the Dugway Pond group (yellow in the flow chart) and the manipulated variable group (blue), but not in the control group (red). Scientists follow a set procedure to find answers to their questions.

90 = 1. Leopard frog eggs are collected at Dugway Pond and taken back to Tyrone’s lab. 2. Some eggs are raised in plain water. 3. Tissues from male frogs are examined. If the results of Tyrone’s experiment support his hypothesis, he should see feminization of frogs in the Dugway Pond group (yellow in the flow chart) and the manipulated variable group (blue).

80 = 1. Eggs are collected at the pond. 2. Some eggs are raised in plain water. 3. Tissues from male frogs are examined. If the results of Tyrone’s experiment support his hypothesis, he should see feminization of frogs.

5. 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: Mom embedded twelve candles in Kenya’s birthday cake.

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!

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.

2. As a reminder, refer students to the Read and Respond homework assignment described in their student editions.
<table>
<thead>
<tr>
<th>Word</th>
<th>Pronunciation</th>
<th>Definition</th>
<th>Sample Sentence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>science</strong> (noun) page 28</td>
<td>sci-eence (SI-ence)</td>
<td>systematic study of the natural world</td>
<td>My uncle studies the <em>science</em> of hurricanes to help people plan for these big storms.</td>
</tr>
<tr>
<td><strong>hypothesis</strong> (noun) page 31</td>
<td>hy-po-th-e-sis (high-PAHTH-ih-sis)</td>
<td>informed prediction</td>
<td>My <em>hypothesis</em> is that I left my book in my math class, so I will go and see if it is there.</td>
</tr>
<tr>
<td><strong>variable</strong> (noun) page 31</td>
<td>var-i-able (VAR-ee-ah-bl)</td>
<td>something that changes</td>
<td>The <em>variable</em> in Jane’s plan for the party is the weather since it might change suddenly.</td>
</tr>
<tr>
<td><strong>reliable</strong> (adjective) page 35</td>
<td>re-li-able (re-LIE-ih-bl)</td>
<td>dependable</td>
<td>Jamie is very <em>reliable</em>, and I can depend on him to take the trash out every week.</td>
</tr>
<tr>
<td><strong>analyzed</strong> (verb) page 41</td>
<td>an-a-lyz-ed (ANN-ah-liezd)</td>
<td>examined carefully</td>
<td>When my math teacher <em>analyzed</em> my answer, she found that I had made a mistake in step 3.</td>
</tr>
<tr>
<td><strong>embedded</strong> (verb) page 41</td>
<td>em-bed-ded (em-BED-ed)</td>
<td>set in, buried in</td>
<td>The fence post was <em>embedded</em> in concrete to keep it stable.</td>
</tr>
<tr>
<td><strong>prudence</strong> (noun) page 48</td>
<td>pru-dence (PROO-dense)</td>
<td>caution</td>
<td>Claire’s <em>prudence</em> made her regularly back up her computer files.</td>
</tr>
<tr>
<td><strong>debate</strong> (noun) page 48</td>
<td>de-bate (de-BATE)</td>
<td>discussion</td>
<td>In the <em>debate</em> over what to eat for lunch, Mom suggested tomato soup and a ham sandwich, but Jason wanted ice cream.</td>
</tr>
</tbody>
</table>
Lesson 3

Reading Objective: Analyze and explain a process and its purpose.

Teacher Background
This section the details of making slides of tissues for examination. Once dehydrated and preserved, tissue is embedded in wax. The wax block is put on a machine similar to a cheese slicer used at the deli counter, called a microtome. Just like a deli slicer slices off thin slices of cheese, the microtome slices thin slices of tissue-embedded wax into a long ribbon of individual slices. These slices are a cross-section of the tissue. After the slices have been glued to glass slides, the tissues are stained to bring out structural details, making their examination easier.

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)

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.

<table>
<thead>
<tr>
<th>Sample Think Aloud</th>
</tr>
</thead>
<tbody>
<tr>
<td>We have been seeing the words <em>science</em> and <em>scientist</em> all through this book. (Model looking up the root word for <em>science.</em>) <em>Science</em> has the Latin root <em>sci-</em> , which means to know and to learn. That makes sense because science is the study of the natural world. If you study the natural world, you will learn a lot and have a lot of knowledge. A lot of scientific words have Latin or Greek roots.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sample Word Map</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="https://via.placeholder.com/150" alt="Word Map Diagram" /></td>
</tr>
</tbody>
</table>

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 text, author, and reading objective.
Interactive Read Aloud

1. Read pages 39 (paragraph 2)–41 (paragraph 1) aloud. Use Think-Pair-Share to prompt use of the skill or strategy. Tell students that there are a variety of ways to show or describe a process, and that one of these ways is a flow chart. Remind students that a sequence chain is one example of a flow chart. Model making a flow chart from information in the text about the first steps used to examine frog tissues.

<table>
<thead>
<tr>
<th>Sample Graphic Organizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>frog put permanently to sleep</td>
</tr>
<tr>
<td>data recorded</td>
</tr>
<tr>
<td>frog preserved in a chemical</td>
</tr>
<tr>
<td>frog dissected</td>
</tr>
</tbody>
</table>

Point out that there are a number of ways to make a flow chart, but the main requirement is that it includes the steps in correct sequence and communicates the steps clearly.

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 continue the flow chart using information on pages 41 (paragraphs 2 and 3) and 42 (paragraph 1).

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.
Teamwork (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: pages 39–45 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.

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.

<table>
<thead>
<tr>
<th>Team Talk Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Summarize the rest of the flow chart for preparing tissues for examination. Give the purpose of making the slides. <strong>(Write)</strong> [RE] (Team Talk rubric)</td>
</tr>
<tr>
<td>100 = Blocks of wax put into special slicing machine → ribbon of slices cut into sections → sections placed on glass slides → slides placed in dye → Tyrone examines slides → number on slide matched to treatment set. Tyrone’s team makes slides of frog tissue so he can examine them to see if there are any differences between the control group and the manipulated variable groups.</td>
</tr>
<tr>
<td>90 = Blocks of wax put into special slicing machine → ribbon of slices cut into sections → slides placed in dye → Tyrone examines slides.</td>
</tr>
<tr>
<td>80 = Ribbon of slices cut into sections → slides placed in dye → Tyrone examines slides.</td>
</tr>
<tr>
<td>2. How is a scientific truth usually determined? (Hint: see page 42.) [RE] (Team Talk rubric)</td>
</tr>
<tr>
<td>100 = According to the text on page 42, a scientific truth cannot be determined by just one experiment. Many different scientists must repeat an experiment and design new ones to collect lots of information. A scientific truth is not agreed upon until lots of scientists try lots of experiments and argue a lot about what all their data means.</td>
</tr>
<tr>
<td>90 = A scientific truth cannot be decided by just one experiment. Many scientists must repeat an experiment and design new ones to collect lots of information.</td>
</tr>
<tr>
<td>80 = It cannot be decided by just one experiment.</td>
</tr>
</tbody>
</table>
3. Describe some of the techniques that the students had to learn in order to complete their experiments. [MI] (Team Talk rubric)

100 = Tyrone’s students need to know how to do many things to carry out these experiments. They must know how to take data on the frogs (weigh and measure the frogs). They must be able to take care of the living frogs and preserve the dead frogs for study. They must prepare slides for viewing under the microscope (making the sections and staining the slides). They must know how to use the microscope to look at the slides. They must know what normal frog tissue looks like and what is not normal. They also must know how to carefully label all the slides and how to make careful notes and organized records of each experiment. This experiment required many techniques, and it takes dedication to learn and apply these techniques.

90 = They must know how to weigh and measure the frogs. They must prepare slides and stain the tissue for viewing under the microscope (making the sections and staining the slides). They must know how to use the microscope to look at the slides. They must know what normal frog tissue looks like and what is not normal. They also must know how to carefully label all the slides and how to make careful notes and organized records of each experiment.

80 = They must know how to weigh and measure. They must prepare slides. They must know how to use the microscope. They also must know how to carefully label all the slides and how to make careful notes and organize records.

4. Why did Tyrone need to repeat his experiments? [RE] (Team Talk rubric)

100 = According to page 45, Tyrone explains, “that’s the thing about experiments: even with careful planning, you can’t always control everything. And sometimes you have to take a second look.” Tyrone took samples and made careful observations at Dugway Pond over several years. He had to keep thinking about the data he collected and look for patterns and connections. There are so many factors that could be causing problems with the frogs that scientists must repeat their experiments many times before they know anything for sure. Scientists must continually make observations, look for patterns, do experiments, and analyze results to be able to say with some certainty that their results mean something.

90 = On page 45, Tyrone explains, “that’s the thing about experiments: even with careful planning, you can’t always control everything. And sometimes you have to take a second look.” There are so many things that could be causing problems with the frogs that scientists must repeat their experiments many times before they know anything for sure.

80 = He had to keep thinking about what he saw and look for things that repeated.

5. What is a synonym for the word reliable? What is an antonym for the word reliable? [CV]

The word reliable usually means dependable, so a synonym is predictable. An antonym for reliable is undependable.
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

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 who 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.

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.
Lesson 4

Reading Objective: Analyze and explain a process and its purpose.

Teacher Background
In today's reading, Tyrone expands his studies to include different kinds of amphibians in different kinds of habitats.

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)

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 text, author, and reading objective.
Interactive Read Aloud

1. Read page 48 (paragraph 8 continued on page 50) aloud. Use Think-Pair-Share to prompt use of the skill or strategy.

   Why did Tyrone study the bullfrogs in the Salinas River?

   He observed that the native red-legged frogs were declining in the Salinas River, and the introduced bullfrogs were taking over the red-legged frogs' habitat. He decided to study the bullfrogs because they were surviving.

2. 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.

<table>
<thead>
<tr>
<th>Observation/Identified Problem/Question</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-legged frogs in the Salinas River were declining, but the introduced bullfrogs were surviving.</td>
<td>Tyrone decided to study the bullfrogs because he found only 1 red-legged frog.</td>
</tr>
</tbody>
</table>

Teamwork (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: pages 46–50 (ending at paragraph 1) 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.

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.

<table>
<thead>
<tr>
<th>Team Talk Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What section of text did you choose to reread and why? What new connection did you make by rereading and reviewing your notes?</td>
</tr>
<tr>
<td>100 = I reread pages 41 and 42 to make sure that I understood how tissues are prepared. I made sure that I had the steps in the correct sequence. I also looked at the pictures to help me get a clear image of the process. I clarified the term “cross-sections” by looking at the slide in the picture on page 42. I think a cross-section is like a slice of bread from a loaf. I also clarified the term “rainbow hues”; it means the dyes were different colors.</td>
</tr>
<tr>
<td>90 = I reread pages 41 and 42 to make sure I understood how tissues are prepared. I made sure that I had the steps in the correct sequence. I also looked at the pictures to help me get a clear image of the process. I clarified the term “cross-sections” by looking at the slide in the picture on page 42. I think a cross-section is like a slice of bread from a loaf.</td>
</tr>
<tr>
<td>80 = I reread pages 41 and 42 to make sure I understood how tissues are prepared. I made sure that I had the steps in the correct sequence.</td>
</tr>
<tr>
<td>2. Summarize the section of text that you reread. (Write) [MI]</td>
</tr>
<tr>
<td>100 = Making slides of tissues takes a number of steps. Tissues have to be dissected out, dehydrated, embedded in wax, sliced into thin sections, put on slides, dyed, and then examined. You need special equipment to do most of these steps.</td>
</tr>
<tr>
<td>90 = Making slides of tissues takes a number of steps. Tissues have to be dissected out, dried, put in wax, sliced into thin sections, put on slides, and dyed.</td>
</tr>
<tr>
<td>80 = Tissues have to be dried, put in wax, sliced, put on slides, dyed, and looked at.</td>
</tr>
</tbody>
</table>

continued
3. What are the benefits of atrazine? [RE] (Team Talk rubric)

100 = Atrazine is commonly used on crops. With atrazine and other pesticides, farmers can grow more food at lower costs. Therefore, more people can be fed, and people won’t have to pay a lot of money to buy food. There are some benefits to pesticides.

90 = Atrazine is commonly used on crops. With atrazine and other pesticides, farmers can grow more food at lower costs.

80 = Atrazine helps farmers.

4. What did Tyrone do after his experiment with the effects of atrazine on leopard frog development? Why? (Write) [RE] (Team Talk rubric)

100 = Tyrone is still concerned about the effects of pesticides on frogs. He may have one answer, but more work needs to be done. He also studied how different amphibians in different habitats are affected. One study was on the effect of pesticides on spadefoot tadpoles, a species that lives in the desert. His results showed that the spadefoot toads don’t seem to be affected by pesticides. At this point, there doesn’t seem to be a clear answer to the effect of pesticides on amphibians—some seem to be affected, and some don’t.

90 = Tyrone is still concerned about the effects of pesticides on frogs. More work needs to be done. One study was on the effect of pesticides on spadefoot tadpoles, a species that lives in the desert. He also studied how different amphibians in different habitats are affected.

80 = He is still worried about the effects of pesticides. More work needs to be done. He studied different amphibians in different habitats.

5. What word from the vocabulary list belongs in the blank? How do you know? [CV]

In _______ class we studied the three types of rocks: igneous, sedimentary, and metamorphic.

Science. Rocks are part of the natural world, and science is the study of the natural world. So the word science fits in the blank.

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 (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 information from the text to describe a process or experiment.

**Teacher Background**
This writing activity requires students to describe the scientific process.

**Active Instruction**
(10 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. 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 text, author, and writing objective.
4. Remind students that they have been reading about the scientific process as used by Dr. Tyrone Hayes to study a problem in nature. Point out that the process that Tyrone uses is the same for other scientists except for the questions asked and the equipment and materials used to run the experiments. Use Think-Pair-Share to ask:
How does Tyrone’s scientific process compare with the process that you use to do an experiment in science class?

*Answers will vary, but should include the basic steps: a question to explore, using variables, control groups, analyzing data, and drawing conclusions. (Generally, students do not generate their own questions to test; these are provided in the experiment lab guidelines.)*

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

<table>
<thead>
<tr>
<th>Writing Prompt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Why does Tyrone use the scientific process to answer his questions? List and describe the general steps in a scientific experiment.</td>
</tr>
</tbody>
</table>

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?**

*This prompt asks me to explain ideas or information on a topic. I know because it asks me to list and describe steps in a process.*

6. 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.

<table>
<thead>
<tr>
<th>Writing to Inform or Explain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ideas</strong></td>
</tr>
<tr>
<td>• Clearly introduce the topic.</td>
</tr>
<tr>
<td>• Develop the topic with relevant details.</td>
</tr>
<tr>
<td><strong>Organization</strong></td>
</tr>
<tr>
<td>• Begin by introducing the topic.</td>
</tr>
<tr>
<td>• In the middle, provide facts, examples, or events that help a reader understand the information.</td>
</tr>
<tr>
<td>• End with a closing statement that supports the information.</td>
</tr>
<tr>
<td><strong>Style</strong></td>
</tr>
<tr>
<td>• Use words and phrases that help a reader understand how the facts or events are related.</td>
</tr>
<tr>
<td>• Include details or examples that help a reader make a mind movie.</td>
</tr>
<tr>
<td><strong>Mechanics</strong></td>
</tr>
<tr>
<td>• Use correct punctuation, capitalization, spelling, and grammar.</td>
</tr>
</tbody>
</table>

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: use information from the text to describe a process or experiment?**

*The guideline for ideas, develop the topic with relevant details, relates to the objective. Also under organization, provide facts, examples, or events to help a reader understand the information. Under style, include details and examples that help a reader make a mind movie also relates to the writing objective.*

7. 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**

Remind students that there are several ways to present a process—numbering steps, using sequence words such as *first* and *next*, and drawing a flow chart.

Model each of these with a simple process such as putting jelly on bread.

**Numbering steps:**

1. Get the jar of jelly out of the refrigerator and take out a slice of bread.
2. Open the jar.
3. Use a spoon or knife to scoop out some jelly.
4. Spread jelly on bread.
5. Close the jar and put it back in the refrigerator. Close the bread bag.

**Using sequence words:**

First, get the jar of jelly out of the refrigerator and take out a slice of bread. Next, open the jar. Then, use a spoon or knife to scoop out some jelly. Next, spread the jelly on the bread. Finally, close the jar and put it back in the refrigerator, and close the bread bag.
Sample Graphic Organizer

1. Get the jar of jelly out of the refrigerator and take out a slice of bread.

2. Open the jar.

3. Use a spoon or knife to scoop out some jelly.

4. Spread jelly on bread.

5. Close the jar and put it back in the refrigerator. Close the bread bag.

Use Random Reporter to have students discuss and report on the values of each of these methods of presenting a process.

Answers will vary.

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.

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

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—use information from the text to describe a process or experiment.

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

For example, ask:

- Does the writer clearly introduce the topic?
- Does the writer use the correct sequence of steps?
- 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 put the steps of the process in the right sequence? Explain.
  Answers will vary.
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

Why does Tyrone use the scientific process to answer his questions? List and describe the general steps in a scientific experiment.

<table>
<thead>
<tr>
<th>Writing to Inform or Explain</th>
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<tbody>
<tr>
<td><strong>Ideas</strong></td>
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<tr>
<td><strong>Style</strong></td>
</tr>
<tr>
<td>• Use words and phrases that help a reader understand how the facts or events are related.</td>
</tr>
<tr>
<td>• Include details or examples that help a reader make a mind movie.</td>
</tr>
<tr>
<td><strong>Mechanics</strong></td>
</tr>
<tr>
<td>• Use correct punctuation, capitalization, spelling, and grammar.</td>
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</tbody>
</table>
Lesson 6

**Reading Objective:** Analyze and explain a process and its purpose.

**Writing Objective:** Use information from the text to describe a process or experiment.

**Teacher Background**
Tyrone feels that his experiments are important, and he tries to educate a wide audience of people about this particular environmental problem.

**Active Instruction** (5 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.

**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 text, author, 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

(5 minutes)

Partner Review

1. Remind students that they have been practicing analyzing and explaining a process and its purpose, and using information from the text to describe a process or experiment. Use Think-Pair-Share to have students identify some of the processes that they have read about in this unit.

(Answers may vary.) We read about the process of a frog egg turning into an adult; we read about the process of making slides.

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 analyzing steps in a process.

4. Ask students to identify key words or phrases in question #3.

3. Why are the students so careful that everything stays the same in an experiment except for the manipulated variable? [DC, RE, SA]

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 more about Dr. Tyrone Hayes and his work.

Test

(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

(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.

Class Discussion

(10 minutes)

Lightning Round
1. Use Random Reporter to have teams share team discussions of the test questions and explain their thinking.
   
   Do you think Tyrone will ever run out of questions? Why?
   No. Everything he learns opens up new questions.
   
   If you worked with Tyrone, what questions would you like to explore?
   Answers will vary.
   
   Do you think other scientists should do experiments on the effects of pesticides on amphibians? Why?
   (Answers may vary.) Yes. In a complex problem, it may take a number of experiments and scientists to get at the real answer. As Tyrone points out, you have to take a second look. The more work that is done, the better the answer should be.
   
   When we first started the book, we identified the topic as frogs and frog scientists and the author’s intent as giving information about frogs and frog scientists. What did you predict the topic and author’s intent would be before you read? After reading, do you still agree with your earlier thoughts? Explain.
   (Answers may vary.) At first, I thought the topic was about frogs. But after reading the book, I think the topic is how the scientific process can answer questions about the decline in the frog populations. I also think part of the topic is to explain how people get into their careers. I think the author’s intent is to use a personal story of a scientist to show how science is done and to highlight an important environmental problem—pesticides and their effects on frogs.
Point out that sometimes you have to read the whole text to understand the full topic and author’s intent.

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.
Cycle 2 Test

Analyze a Process

**Directions**: Read *The Frog Scientist*, pages 50 (paragraph 1), 51, and sidebars on pages 54 and 55. Use the TIGRRS process, and answer the following questions on a separate piece of paper. Some of the questions are based on today’s reading, and other questions are about the text that you read in previous lessons. You may refer to your notes from this cycle.

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

1. **What is the topic?**
   
   *The topic is another study that Tyrone did on the effects of mixed pesticides on frogs and how he is trying to educate people about this problem.*
   
2. **What is the author’s intent?**
   
   *The author’s intent is to describe Tyrone’s efforts to figure out how and why pesticides affect frogs.*
   
3. **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]**
   
   **20 points** = When Tyrone studied bullfrogs in the Salinas River, he found that those that grew in the clean part of the river were healthy, but those in the lower part of the river that had drainage from farms were much smaller. He then thought that he should study the effects of mixed pesticides on frogs— if frogs were raised in only one pesticide, almost all survived, but one-third of those raised in a mix of nine pesticides died. Tyrone believes that pesticides are contributing to the decline in frog populations. He thinks that he should educate the public, so he gives talks to groups ranging from other scientists to middle school students.
   
   **15 points** = When Tyrone studied bullfrogs in the Salinas River, he found that those that grew in the clean part of the river were healthy, but those in the lower part of the river that had drainage from farms were much smaller. He then thought that he should study the effects of mixed pesticides on frogs. He thinks that he should educate the public, so he gives talks to groups ranging from other scientists to middle school students.
   
   **10 points** = When he studied bullfrogs, he found that those that grew in the clean part of the river were healthy, but those in the lower part that had drainage from farms were smaller. He then thought that he should study the effects of mixed pesticides on frogs. He thinks that he should educate the public.
2. How and why did Tyrone find out about the effects of atrazine on frogs in the wild from California to the Iowa-Illinois border? Summarize the steps that he used. [RE]

**20 points** = After repeating his laboratory experiments with African clawed frogs and leopard frogs, he wondered if the same thing would happen with frogs in their environment. 1. Drove a big truck from California to Iowa-Illinois border. 2. Stopped at various places with frogs. 3. Collected frog eggs, juvenile leopard frogs, and water from the places. 4. Examined the frogs and the water. 5. Results showed that about a third of male leopard frogs in the wild were feminized if they came from a pond with atrazine in the water. **One experiment often leads to other experiments.**

**15 points** = After repeating his laboratory experiments with African clawed frogs and leopard frogs, he wondered if the same thing would happen with frogs in their environment. 1. Drove a big truck from California to Iowa-Illinois border. 2. Stopped at various places with frogs. 3. Collected frog eggs, juvenile leopard frogs, and water from the places. 4. Examined the frogs and the water. 5. Results showed that about a third of male leopard frogs in the wild were feminized if they came from a pond with atrazine in the water.

**10 points** = 1. Drove a big truck from California to Illinois. 2. Stopped at various places with frogs. 3. Collected frog eggs, juvenile leopard frogs, and water from the places.

3. Why are the students so careful that everything stays the same in an experiment except for the manipulated variable? [DC, RE, SA]

**20 points** = Anyone who does an experiment testing the effect of something has to keep all conditions the same except for the manipulated variable that is being tested. If you don’t, then you won’t know what caused the effect—was it the manipulated variable you were testing or something else that was different during the tests? To get good results, experiments must be set up and done very carefully.

**15 points** = Anyone who does an experiment testing the effect of something has to keep all conditions the same except for the thing that is being tested. If you don’t, then you won’t know what caused the effect—was it the manipulated variable you were testing or something else that was different during the tests?

**10 points** = If you don’t, then you won’t know what caused the effect.

4. What is the “big picture” that Tyrone thinks everyone should look at? [RE, AP]

**20 points** = Tyrone believes that more questions need to be asked about how mixes of different pesticides affect frogs. He believes that it might matter how many different kinds of chemicals are in the water when tadpoles are developing. Each finding raises new questions.

**15 points** = Tyrone believes that more questions need to be asked about how mixes of different pesticides affect frogs. He believes that it might matter how many different kinds of chemicals are in the water when tadpoles are growing.

**10 points** = He asks about how mixes of different pesticides affect frogs.
5. Which of the ideas in “Helping Frogs in Your Community” on page 54 do you think Tyrone would support? Explain your answer. [RE, AP]

(Answers may vary.)

20 points = I think Tyrone would **promote** the last idea: teaching others about the problems facing frogs. On page 51, he says, “If I can’t teach people about my research, then the impact of my research is limited.” I think he feels that telling people about frogs and their problems is very important. If more people know about frogs and their problems, more people might become interested and do something about frogs in their area.

15 points = I think Tyrone would support the last idea: teaching others about the problems facing frogs. I think he feels that telling people about frogs and their problems is very important.

10 points = I think he would like the last idea.

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

Write at least one paragraph to answer the following question:

Why does Tyrone question how mixes of pesticides might affect frogs? List and describe the steps he could use to do an experiment to answer this question. [RE]

(Answers may vary.)

Tyrone asked this question based on his observations that bullfrogs that grew up in the clean part of the Salinas River were healthy and those that grew up in the part of the river that was contaminated by farms were much smaller. Tyrone thinks that the difference might be that the small bullfrogs grew up in a mix of pesticides, so he decided to test that. His experiment could follow these steps:

**Hypothesis:** If frogs are raised in a mix of pesticides, then they will be less healthy than those raised in clean water.

**Manipulated variables:** the type, amounts, and number of pesticides in the water

**Responding variable:** the health of the bullfrogs

**Treatment groups:** Eggs, tadpoles, and young frogs will be raised in different water containing different types, amounts, and numbers of pesticides.

**Control group:** Eggs, tadpoles, and young frogs will be raised in clean water.

**Examining results:** Measurements will be taken of all young frogs and tissue samples examined. Compare results among the different treatment groups to see if there are any differences.

Science has a specific, repeatable process designed to give repeatable results to answer questions.
The following guide is used to score part II of the cycle test.

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

1. “The tiny bits of frog tissue must be embedded in wax because the tissue must be cut into thin slices for viewing under the microscope.” In this sentence, the word **embedded** most nearly means— [CV]
   
   A. taken out of.
   B. enlarged by.
   C. folded up.
   D. set in.

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

   *Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: Our mail carrier is very reliable and always delivers the mail on time.*

3. What is a synonym for the word **debate**? What is an antonym for the word **debate**? [CV]

   *A synonym for the word debate is argument. An antonym for the word debate is agreement.*

4. “A hypothesis is an idea that the experiment is designed to test.” In this sentence, the word **hypothesis** means— [CV]

   A. conclusion.
   B. math error.
   C. informed prediction.
   D. tissue.
5. Write a meaningful sentence using the word science. [CV]

Accept responses that show that the student knows the meaning of the word and can use it correctly. For example: The science of meteorology helps us predict the weather.

6. What is a synonym for the word prudence? What is an antonym for the word prudence? [CV]

A synonym for the word prudence is caution. An antonym for the word prudence is carelessness.

7. A _______ in this experiment is the different temperatures in which the plants grew. Choose the word that belongs in the blank. [CV]
   A. constant
   B. control
   C. variable
   D. analyzed

8. In which of the following sentences is the word analyzed used incorrectly? [CV]
   A. Dr. Smith analyzed the food and found that it contained sugar, flour, cinnamon, milk, and eggs.
   B. When we analyzed the survey results, we found that 51% of the students preferred a picnic at the national park and 49% preferred a trip to the zoo.
   C. Mrs. Simpson analyzed my sentence to find the subject, verb, and object.
   D. The liver of a codfish analyzed vitamin A by putting together several substances to make it.

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]

We clarified the word vented on page 20. It sounded like air vent, so vented means to let air in. Juan opened the window and vented the room to get rid of the smell of burned coffee.

10. In the sentence “A few months before this amphibian airlift, scientist Karen Lips reported that the deadly chytrid fungus (which had already devastated frog populations in Costa Rica) was moving southeast,” devastated most nearly means— [CV]
    A. decided.
    B. depended.
    C. destroyed.
    D. designed.

Explain how you figured out the meaning of devastated.

Students will explain their thinking. For example: I used the context. The passage talks about the fungus being deadly, so devastated must mean destroyed.
<table>
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<th>Question Codes</th>
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</thead>
<tbody>
<tr>
<td>[SA]</td>
<td>Support an answer; cite supporting evidence.</td>
<td>[AP]</td>
<td>Identify author's intent or purpose.</td>
</tr>
<tr>
<td>[MI]</td>
<td>Identify the main idea that is stated or implied.</td>
<td>[RE]</td>
<td>Analyze relationships (ideas, story elements, text structures).</td>
</tr>
</tbody>
</table>
Lesson 7

Reading Objective: Analyze and explain a process and its purpose.

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.
**Teamwork**

(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.

<table>
<thead>
<tr>
<th>Read and Respond Questions</th>
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<td><strong>1.</strong></td>
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<td><strong>4.</strong></td>
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<td><strong>5.</strong></td>
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<td><strong>6.</strong></td>
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</table>
Class Discussion

(15 minutes)

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 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?**
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?**
Sample Word Map
Cycle 1

Word Power Journal Sample Entries

-ology (study of)
-ology (study of)
giology (study of the earth)
nicology (study of music)
ology (study of animals)
eteorology (study of weather)
gyptology (study of Egypt)
bacteriology (study of bacteria)

bio- (life, living)
biologist (one who studies living things)
phibious (both lives)
antibiotic (against life)
bigraphy (writing about a person’s life)
biochemistry (chemistry of living things)

Greek roots

biology

microbiology
(study of tiny living things)
Sample Word Map
Cycle 2

- scientist
- scientific
- science

**conscience**
(inner knowledge of one's self)

**omniscient**
(all knowing)

**omniscient point of view**
(3rd person omniscient = the narrator knows everything about every character)

**conscious**
(awake, alive, capable of knowing)

**unconscious**
(not awake, incapable of knowing)

Latin root *sci-*
(to know, to learn)
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.

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<thead>
<tr>
<th>Level 6H</th>
<th>Analyze a Process</th>
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<tbody>
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<td><strong>English Language Arts Standards: Science and Technical Subjects</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Craft and Structure</strong></td>
<td></td>
</tr>
<tr>
<td>RST.6-8.5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.</td>
<td></td>
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<tr>
<td>RST.6-8.6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.</td>
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<tr>
<td><strong>Integration of Knowledge and Ideas</strong></td>
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<tr>
<td>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).</td>
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<td><strong>English Language Arts Standards: Writing</strong></td>
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<tr>
<td><strong>Text Types and Purposes</strong></td>
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<tr>
<td>WHST.6-8.2b. Develop the topic with relevant, well-chosen facts, definitions, concrete details, quotations, or other information and examples.</td>
<td></td>
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<tr>
<td><strong>Research to Build and Present Knowledge</strong></td>
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<tr>
<td>W.7.9. Draw evidence from literary or informational texts to support analysis, reflection, and research.</td>
<td></td>
</tr>
</tbody>
</table>
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