Life Cycles

Learning Objectives

Students will:
- describe relationships between ideas and concepts from the text using language that pertains to time and sequence.
- write an informative paragraph about an animal’s life cycle.
- compare and contrast the life cycles of various organisms.

Standards

- **Reading**: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.
- **Writing**: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
- **Content**: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death.
- **Language**: Communicate information, ideas, and concepts necessary for academic success in the content area of Science.

Lesson Timeline

<table>
<thead>
<tr>
<th>Day 1</th>
<th>Task</th>
<th>Introductory and Lab Activities (page 40)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Summary of Student Learning Activities</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compare and contrast the life cycles of insects and mammals.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 2</th>
<th>Task</th>
<th>Before Reading (page 41)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Summary of Student Learning Activities</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Practice using language that pertains to sequence.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 3</th>
<th>Task</th>
<th>During Reading (page 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Summary of Student Learning Activities</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Describe sequential connections in the text, and plan a paragraph about an interesting life cycle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 4</th>
<th>Task</th>
<th>After Reading (page 43)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Summary of Student Learning Activities</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Write a paragraph about a life cycle.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Day 5</th>
<th>Task</th>
<th>Activity from the Book (page 43) and Assessments (pages 48–49)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><strong>Summary of Student Learning Activities</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Identify abilities at different stages in life, and take the assessments.</td>
</tr>
</tbody>
</table>
Compare and contrast the life cycles of insects and mammals.

**Materials**
- copies of the Venn Diagram activity sheet (page 44)
- index cards
- coloring supplies
- string
- hole punch
- pictures of the insect and mammal life cycle stages

**Introductory Activity** Engage

1. On the board or on chart paper, draw a sequencing chart with at least five boxes. Inside the first box, write baby. Explain that a life cycle is a set of changes or stages in life. **Note:** You may wish to provide images of a human throughout different stages of life. This can be found on page 23 of the Life Cycles book.

2. Help students list the stages of the human life cycle. Record the information on the sequencing chart. Tell students that they will learn about the life cycles of other living things.

**Lab Activity** Explore & Explain

1. Place students in small groups. Distribute index cards, coloring supplies, string, and a hole punch to groups. Show students pictures of each stage in the insect and the mammal life cycles, and give a brief explanation of each stage. **Note:** These can be found on page 7 and pages 18–23 of the Life Cycles book.

2. Have groups work together to write the name, write a short description, and draw a picture for each stage on index cards. Have students use one card per stage.

3. Demonstrate how to use the hole punch to make holes on both sides of each index card. Then, have students use string to tie the cards together in order in a circle. **Note:** Have students position the cards so their writing and drawings are facing the same direction. The insect and mammal life cycles should be separate chains.

4. Distribute copies of the Venn Diagram activity sheet (page 44) to students. Have students compare and contrast the two life cycles and record their observations on the activity sheet.

5. Ask questions to guide students to the idea that insects and mammals have different life cycles, but that in both they grow, change, reproduce, and die.
   > How are these two life cycles alike and different?
   > What stages are similar and different?
   > What patterns do you recognize in the stages of a life cycle?
   > What conclusions can you draw about the life cycles of other living things?

6. Bring the class together for instruction. Clarify misconceptions by having students explain their understandings using logic and evidence to support their ideas.
Materials
- Life Cycles books
- copies of the Knowledge Rating Scale activity sheet (page 45)

Vocabulary Word Bank
- adolescent
- germination
- juvenile
- larva
- metamorphosis
- pupa

Before Reading

1. Write the vocabulary words on the board and read them aloud. Distribute copies of the Knowledge Rating Scale activity sheet (page 45) to students. Have students write the vocabulary words and place an X in the appropriate column, depending on how well they know the word. Have students share definitions or examples of words they know well. Help students use the glossary and images in the book to determine the meanings of words that are unfamiliar.

2. Tell students that one way nonfiction texts can be arranged is sequentially. Write a list of words and phrases that indicate sequence on the board or on chart paper, such as first, then, next, after, until, later, eventually, and finally. Tell students that when they see these words, it usually indicates that the text is arranged sequentially.

➢ Help below-level learners and English language learners identify how each sequence word describes the progression of a cycle.

During Reading

3. Display the Life Cycles book for students. Help them practice using sequence words to make connections in the text. Show students pages 16 and 17 of the book. Invite them to describe what they see in the picture using words and phrases indicating sequence.

4. Have students continue to practice using sequence words for other life cycles in the book.
➢ Challenge above-level learners to use the vocabulary words in their descriptions, when possible.

5. Explain to students that describing the relationships between ideas in a text can help readers understand and remember what they are reading. Tell students that they will learn more about life cycles as they read the book.
Day 3

Describe sequential connections in the text, and plan a paragraph about an interesting life cycle.

Materials
- *Life Cycles* books
- copies of the *Planning My Writing* activity sheet (page 46)

During Reading – Elaborate

1. Distribute the *Life Cycles* books to students. For the first reading, conduct an echo reading of the book. Pause periodically to describe the sequential relationships between the stages of plant and animal life cycles. For example, after reading page 7, point out the use of sequencing words such as first, then, and a few weeks later.
   ➢ You may choose to display the Interactiv-eBook for a more digitally enhanced reading experience.

2. For the second reading, have students read in small groups. Instruct students to take turns reading sentences aloud in their groups. Ask them to use symbols to record places where they see sequential relationships between ideas in the text.
   ➢ You may wish to have students digitally annotate the PDF of the text.
   ➢ For below-level learners and English language learners, you may choose to play the audio recording as students follow along to serve as a model of fluent reading. This may be done in small groups or at a listening station. The recording will help struggling readers practice fluency and aid in comprehension.

3. After reading, ask students to describe the sequential relationships they saw between ideas in the text. Assist students as necessary in using language that describes the sequence of events in the various life cycles.

4. Distribute copies of the *Planning My Writing* activity sheet (page 46) to students. Help students brainstorm reasons why different life cycles are interesting. Model how to write introduction and conclusion sentences. Then, have students use the book to complete the activity sheet. Once students are finished, have them add sequence words and vocabulary words to their writing. **Note:** Have students save their activity sheets for later use.
Materials

- Life Cycles books
- copies of the Informative Paragraph, Life Cycles Quiz and Animal Life Spans activity sheets (pages 47–49)
- students’ copies of the Planning My Writing activity sheet (page 46)
- chart paper
- coloring supplies

After Reading

1. Place students in small groups and assign each group a vocabulary word. Distribute chart paper and coloring supplies to groups. Instruct them to create a poster with images, words, and phrases that depict the meaning of their vocabulary word. Have groups share their posters with the class.

2. Tell students they will write about an animal’s life cycle using sequence words. Review sequencing words students found in the book.

3. Have students review their copies of the Planning My Writing activity sheet from the During Reading activity. Have them discuss their paragraphs and the sequencing words they added with a partner.

4. Distribute copies of the Informative Paragraph activity sheet (page 47) to students. Have students use their Planning My Writing activity sheets to write an organized paragraph about an animal’s life cycle. Remind students to add the sequencing words and any applicable vocabulary words to their paragraphs.

Activity from the Book

Read the Your Turn! prompt aloud from page 32 of the Life Cycles book. Have students make a list of things they can do now, things they will be able to do as an adolescent, and things they will do as an adult.

1. A short posttest, Life Cycles Quiz (page 48), is provided to assess student learning from the book.

2. A data analysis activity, Animal Life Spans (page 49), is provided to assess students’ understanding of how to analyze scientific data. Point to the bar graph and demonstrate how to identify the life span of each animal on the graph.

3. The Interactiv-eBook activities may be used as a form of assessment (optional).
Venn Diagram

Directions: Complete the Venn diagram to compare and contrast the life cycles of insects and mammals.
# Knowledge Rating Scale

**Directions:** Write the vocabulary words in the chart below. Mark an X on the chart to show how well you know each word.

<table>
<thead>
<tr>
<th>Vocabulary Word</th>
<th>Know It Well</th>
<th>Have Heard or Seen It</th>
<th>Don’t Know It</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name: __________________________     Date: __________

© Teacher Created Materials
Planning My Writing

**Directions:** Choose an animal from the book that has an interesting life cycle. Use the chart below to plan a paragraph that explains the animal’s life cycle.

<table>
<thead>
<tr>
<th>Animal</th>
<th>Page(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Introduction**

**Stages in the Life Cycle**

**Conclusion**
Informative Paragraph

Directions: Write an informative paragraph about an animal’s life cycle.

_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
_________________________________________________________________
Life Cycles Quiz

Directions: Read each question. Choose the best answer. Fill in the bubble for the answer you have chosen.

1. Which linking word could you choose when describing a sequence of events?
   A. if  
   B. but  
   C. or  
   D. afterwards

2. How are the life cycles of trees and salmon different?
   A. Salmon hatch from eggs but trees do not.  
   B. Salmon grow but trees do not.  
   C. Trees reproduce but salmon do not reproduce.  
   D. They are exactly the same.

3. Which are NOT names of life cycle stages?
   A. babysitter, mom, dad, grandma  
   B. kit, yearling, juvenile, adult  
   C. baby, calf, adolescent, adult  
   D. eggs, larvae, adult

4. Which detail supports the idea that all living things grow and change?
   A. Cocoons come in all shapes and sizes.  
   B. Caterpillars turn into butterflies.  
   C. A mother octopus’s den is also called a garden.  
   D. There are many types of butterflies.

5. Which sentence describes a sequence of events?
   A. Before a baby is born, the mother elephant chooses an “aunt.”  
   B. Humans grow in stages.  
   C. A butterfly begins life as an egg.  
   D. The human life cycle is much like the life cycle of elephants!

6. All plants and animals ______ and change.
   A. smell  
   B. shrink  
   C. grow  
   D. sleep
**Solids Reader Lesson Plan**

**Learning Objectives**
- Students use reading skills and strategies to understand and interpret nonfiction. (Reading Objective)
- Students understand appropriate vocabulary. (Reading Objective)
- Students understand that geometric shapes are useful for representing and describing real-world situations. (Math Objective)
- Students understand the structure and properties of matter. (Science Objective)
- Students know that different objects are made up of many different types of materials (e.g., cloth, paper, wood, metal) and have many different observable properties (e.g., color, size, shape, weight). (Science Objective)
- Students know that things can be done to materials to change some of their properties (e.g., heating, freezing, mixing, cutting, dissolving, bending), but not all materials respond the same way to what is done to them. (Science Objective)

**Materials**
- **Solids** reader (solids.doc; solids.pdf)
- miscellaneous objects such as a stapler, feather, and a length of yarn
- chart paper and markers
- **Solids Around Us** PDF file (aroundus.pdf)
- drawing paper
  - **Solid Properties** activity sheets (pages 76–77; page76.pdf)
  - **Particles Go Crazy!** activity sheet (page 78; page78.pdf)
  - **Reader Quiz** (page 79; page79.pdf)
  - materials for the Lab activity (page 72)

**Before Reading**

1. Conduct the Introductory Activity (page 68) with the whole class. Then, divide the class into reading groups. On- or above-grade-level students should read the **Solids** reader.

2. Display miscellaneous objects, such as a stapler, a feather, and a length of yarn. Ask students to make observations about the objects. Allow them to touch and look at them, and then describe them. List the students’ descriptions on chart paper to use in Step 11 (page 74) (see example below). Ask students to think of one thing that all the objects have in common. (They are all solid objects; this attribute will be disclosed in the next step.)

<table>
<thead>
<tr>
<th>stapler</th>
<th>feather</th>
<th>yarn</th>
</tr>
</thead>
<tbody>
<tr>
<td>hard</td>
<td>soft</td>
<td>fuzzy</td>
</tr>
<tr>
<td>springy</td>
<td>light</td>
<td>flexible</td>
</tr>
</tbody>
</table>
Before Reading (cont.)

3. Display the Solids Around Us PDF file (aroundus.pdf) found on the Teacher Resource CD. Look at and discuss the pictures of solid objects. If needed, review basic shapes appropriate for your grade level. Have one student at a time share one shape he or she sees on the PDF and outline it for the class. Keep a list of the shapes that students mention. Also, have students identify what each object is made of (wood, cloth, stone). Lead students to understand that they are all solid objects.

4. Review what students learned about the particles in solids from the Introductory Activity. Ask if all solids are the same. Have students skim through their readers and find two solid objects that probably have different particle make-ups (Students’ responses will vary, but some solids are squishy; some melt more easily than others; etc.) Use words like “hard,” “squishy,” or “soft” when describing the different solids to help students understand different particle make-ups.

5. Introduce the vocabulary words students will encounter in the text. Write the words on the board. Have students work in pairs to discuss the words and what they think they mean. Discuss their meanings as a class.

Vocabulary
lava     matter     particle     properties

6. Model and have students fold a sheet of drawing paper into four sections. Show students how to write one word and a definition in each section, and then have them draw an illustration for each word. Use the glossary in the back of the reader as needed.

During Reading

7. Decide whether this reader will be read as a group, in pairs, or independently.

8. Have students read pages 4–5 of the reader. Have the students look around the room. Rapidly point to one student at a time. Have each student state one item in the classroom that is matter. Challenge students state a piece of matter within three seconds.

9. Have students read pages 6–7 of the reader. Discuss and clarify how the students know all the things they listed in Step 8 are matter. (They all take up space.)

10. Have students read pages 8–9 of the reader. Summarize what makes solids different from other forms of matter. (They tend to keep their own shape.)

11. Have students read pages 10–13 of the reader. Review what a property is. Then, have students explain the term in their own words. Review the chart from Step 2 (page 73). All the students’ observations are properties. Distribute copies of the Solid Properties activity sheets (pages 76–77) to students. Read the directions together. Then, have students complete the pages independently or with partners. Once everyone is finished, allow time for students to share some of the properties that they listed during Step 2.
During Reading (cont.)

12. Have students read pages 14–17 of the reader. What are two ways matter can change? (heating or cooling) Ask the students if rocks melt. (Yes; lava is liquid rock.)

13. Have students read pages 18–21 of the reader. Discuss and clarify how liquids and solids are alike and different.

14. Have students read pages 22–23 of the reader. Discuss and clarify how gases, liquids, and solids are alike and different. Reiterate that all matter—whether a solid, liquid, or gas—takes up space.

15. Have students read pages 24–27 of the reader. A hot bowl of chicken noodle soup has all three states of matter. Ask students to list other objects that are made of all three states, or can change to be all three states.

After Reading

16. The introductory activity showed students that the particles in matter act differently. Reread the summary to explain this on pages 22–23 of the reader. Distribute the activity sheet, Particles Go Crazy! (page 78). Read the directions as a group. Discuss how students might draw the particles to show how they changed. Then, allow them time to complete the activity.

17. Use the Reader Quiz (page 79) to further assess student learning.

18. Gather students together as a whole class to complete the Lab (pages 71–72).

19. As a class, complete the Concluding Activity (page 69).

Extension Ideas

- As a group, read A Scientist Today on page 32 of the reader. Have students discuss in partners what kind of matter might be in outer space. Give each student a sheet of drawing paper. The students should draw and label the matter that they believe scientists study in outer space.

- Have students write a story about their favorite holiday. Make sure their stories include five or more solids and explain how at least one solid turned into a liquid. Be sure the students underline the solids in their story.

Note: Additional extension ideas may be found in the Differentiation Strategies section (page 70) of this unit.
Solid Properties

**Directions:** Write two properties for each object. If you need help, use the words in the Properties box below. Some properties may be used more than once. Some may not be used at all.

**Properties**
- soft
- light
- heavy
- scratchy
- rough
- bumpy
- smooth
- slick
- hard
- cold
- fluffy
- flexible

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td></td>
</tr>
</tbody>
</table>

**On My Own!**

3. ____________________________
   ____________________________

4. ____________________________
   ____________________________
**Solid Properties (cont.)**

**Directions:** Think about these solids. Think about how they look, act, and feel. These are all solid properties. Write one word in each space to tell about the properties of these solids.

<table>
<thead>
<tr>
<th>Solid</th>
<th>How It Looks</th>
<th>How It Acts</th>
<th>How It Feels</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Icicles</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Paper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Cookie dough</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. On My Own!</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. Which two solids do you think are the most ALIKE? Tell why you think this.

__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
__________________________________________________________________________
Particles Go Crazy!

Directions: Read each story. Draw the matter before and after it changes. Then, draw how the particles might look in all four illustrations.

**Freezing**

Felix is coloring outside. He leaves his crayons in the sun. The crayons begin to melt. The crayons are changing from a solid to a liquid. The particles are also changing.

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
</table>

**Melting**

Jenna wants to make frozen yogurt. She puts a cup of yogurt into the freezer. Her yogurt will change from a liquid to a solid.

<table>
<thead>
<tr>
<th>Before</th>
<th>After</th>
</tr>
</thead>
</table>
Name ____________________________

**Reader Quiz**

**Directions:** Circle the best answer.

1. What is a solid?
   a. a kind of matter
   b. something hard
   c. something heavy
   d. something that moves

2. What is true of all solids?
   a. They keep their shape.
   b. They never change to a liquid.
   c. They have just a few particles.
   d. They are all made of wood.

3. The particles in a solid
   a. move slowly.
   b. move fast.
   c. are the same as gases.
   d. are the same as liquids.

4. A birdhouse is made of wood. What are properties of this solid?
   a. It is hard.
   b. It has color.
   c. It has weight.
   d. All of these.

**Directions:** Answer the question. Draw a picture with your answer.

5. A blanket is a solid. Write a few words that tell how a blanket looks, acts, or feels.

_________________________________
_________________________________
_________________________________
_________________________________
Solids

**Solids Answer Key**

**Solid Properties** (pages 76–77)

1. heavy; scratchy; rough; bumpy; hard; flexible
2. light; smooth; slick; hard; cold
3. bumpy; smooth; slick; flexible; cold
4.–9. Responses will vary

**Particles Go Crazy!** (page 78)

Student drawings will vary, though they should show liquid particles farther apart than solid particles.

**Reader Quiz** (page 79)

1. a
2. a
3. a
4. d
5. Answers and drawings will vary.
Stars Reader Lesson Plan

Learning Objectives

- Students use reading skills and strategies to understand and interpret informational text. (Reading Objective)
- Students understand the main idea and supporting details of simple expository information. (Reading Objective)
- Students know that the stars are innumerable, unevenly dispersed, and of unequal brightness. (Science Objective)
- Students know basic patterns of the sun (e.g., the sun appears everyday; the sun appears to move from east to west). (Science Objective)
- Students understand and apply basic and advanced properties of the concepts of numbers. (Math Objective)

Materials

- Stars reader (stars.doc; stars.pdf)
- Seeing Faraway Stars Up Close PDF file (upclose.pdf)
- paper and drawing materials
- Big Universe activity sheet (page 76; page76.pdf)
- Types of Stars chart (types.pdf)
- All Kinds of Stars (page 77; page77.pdf)
- Earth’s Closest Star activity sheet (page 78; page78.pdf)
- Reader Quiz (page 79; page79.pdf)
- materials for the Lab activity (page 72)

Before Reading

1. Conduct the Introductory Activity (page 68) with the whole class. Then, divide students into reading groups. On- or above-grade-level students should read the Stars reader.

2. Ask if anyone has ever gazed at the stars. Define the term stargazing, if needed. Have students describe how the stars looked. Ask students the following questions:
   - Were they all the same size?
   - Were they all the same color?
   - Were they all the same brightness?
   Have students discuss why they may have seen differences in the stars’ sizes, colors, and brightness. Explain to students that they will learn more about this during their reading.

3. Display the PDF file Seeing Faraway Stars Up Close (upclose.pdf), found on the Teacher Resource CD. Look at the picture of the telescopes on Mauna Kea. Explain that telescopes allow scientists to study the stars up close. Read the information on the activity sheet. Review why Mauna Kea is the ideal place for scientists to study the stars and planets. Discuss how hobby telescopes are different from those on Mauna Kea.
Before Reading (cont.)

4. Review what students learned about the number of stars in the sky from the Introductory Activity. Ask if they think scientists will ever be able to count all the stars. Take a class poll. Discuss why or why not.

5. Introduce the vocabulary words students will encounter in the text. Write the words on the board. Have students work in pairs to discuss the words and what they think they mean. Discuss their meanings as a class.

6. Have students fold a sheet of paper into four sections. Instruct them to write one word and a definition in each section and then draw an illustration for each word. Use the glossary in the reader as needed.

During Reading

7. Decide whether this reader will be read as a group, in pairs, or independently.

8. Have students read pages 4–5 in the reader. Repeat the poem together. Ask if anyone has ever wished on a star. Allow students to share what they would wish for if they saw a wishing star tonight.

9. Discuss with students how they think stars, galaxies, and the universe are related. Have students read pages 6–15 in the reader. Have the students turn to a partner and list three facts they learned about stars. Discuss why stars seem so small in the night sky if they are really so big. Review how stars, galaxies, and the universe are related. Distribute copies of the activity sheet *Big Universe* (page 76) to students. Help students complete the page as needed.

10. Discuss how stars in the night sky look different from one another. Explain that although they all look like little points of light, each is very different. As they read, students should think about three ways a star might be different from other stars. Have students read pages 16–25 in the reader. Distribute copies or post the *Types of Stars* chart (types.pdf) to compare a star’s brightness to its size. Discuss the position of the red dwarf (on the bottom left of the chart because it is small and dim). Discuss the position of the yellow star (midway between the other two stars in size and brightness). Discuss the position of the blue giant (on the top right of the chart because it is the biggest and brightest of the three). Discuss how the chart visually compares different stars’ sizes and brightness. Ask students where they would position a super giant star.
During Reading (cont.)

11. Have students read pages 26–27 in the reader. Ask how students’ knowledge about stars has changed what they will think the next time they look at the night sky. Allow students time to share their ideas with a partner. They may illustrate and record their thoughts on a sheet of paper.

After Reading

12. Review the class poll from Step 4 of the Before Reading activities. Discuss whether this question was answered. Clarify why no one will ever be able to count all the stars in the universe.

13. The students learned that our sun is a yellow star. Have students use the reader’s Index to find information about our sun. Review how it compares with other stars in the universe. Display again, the PDF file Types of Stars from the Teacher Resource CD. Distribute copies of the activity sheet All Kinds of Stars (page 77) to students. Review comparison words (-er; -est), if needed. Explain which words students would use if they were to compare the sizes of the stars (big, bigger, biggest). Explain which words students would use if they were to compare the brightness of the stars (bright, brighter, brightest). Show students how to label the stars to compare their size and brightness. Allow them time to complete the activity. Next, distribute copies of the activity sheet Earth’s Closest Star (page 78) to students. Allow time for students to complete this activity using the reader and the displayed PDF file.

14. Use the Reader Quiz (page 79) to further assess student learning.

15. Gather students together as a whole class to complete the lab (pages 71–72).

16. As a class, complete the Concluding Activity (page 69).

Extension Ideas

- As a group, read A Scientist Today on page 32 in the reader. Have students discuss in pairs why they would or would not want to join this scientist during her study of stars.

- The reader references thousands, millions, and billions. Show students how to read numbers in the thousands, millions, and billions (as appropriate). Play a game to reinforce numbers through the millions called “How many stars are in my galaxy?” Use 16 blank note cards. Write random numerals on them, 0 through 9. Up to four students may play at one time. Have students turn the cards upside down in the play area. Then, have each player take one card at a time and place it in the ones, tens, hundreds, thousands, or millions place on a place-value chart. Once a card is placed, it must stay in that place. After all the place values are complete, players take turns reading the number aloud to the group. Students should attempt to make the largest number possible. Shuffle the cards and continue playing for several rounds.

Note: Additional extension ideas may be found in the Differentiation Strategies section (page 70) of this unit.
Big Universe

Directions: Fill in the blanks using the words in the Word Box below. Then draw a picture to match each sentence.

**Word Box**
- galaxies
- planets
- stars
- universe

1. There are some ______________________ that orbit stars.

2. There are millions of ________________ in a galaxy.

3. The universe is made up of many ________________.

4. The ________________ is bigger than we know.
All Kinds of Stars

Directions: Read pages 22–25 in the *Stars* reader. Use the Word Box to write what you know about different kinds of stars. Compare their sizes. Compare their brightness. Color the stars to match their names.

**Word Box**

<table>
<thead>
<tr>
<th>big</th>
<th>bright</th>
</tr>
</thead>
<tbody>
<tr>
<td>bigger</td>
<td>brighter</td>
</tr>
<tr>
<td>biggest</td>
<td>brightest</td>
</tr>
</tbody>
</table>

Red Dwarf Star

Blue Giant Star

Yellow Star
Earth’s Closest Star

Directions: Think about what you learned about stars. Compare the star closest to Earth to other kinds of stars. Then draw a picture of the sun and other types of stars.

1. Our sun gives off more light than a __________________________.

2. Our sun gives off less light than a ____________________________.

3. This type of star is smaller than our sun. ________________

4. This type of star is bigger than our sun. ________________

5. Which star is even bigger than a blue giant star? ______________
Reader Quiz

Directions: Circle the best answer.

1. Why can no one count all the stars in the universe?
   a. There are too many stars to count.
   b. Stars move around too often.
   c. Some stars look like planets.
   d. none of the above

2. Why can no one see stars during the day?
   a. They are not there during the day.
   b. The sun is too bright to let people see the stars.
   c. They are on the other side of Earth.
   d. They turn blue like the daytime sky.

3. All stars are:
   a. bigger than Earth.
   b. smaller than Earth.
   c. the same size as Earth.
   d. the same size.

4. How many stars are in a galaxy?
   a. two or three
   b. one hundred
   c. millions
   d. none

Directions: Answer the question. Draw a picture with your answer.

5. Why are stars important?
   _________________________________
   _________________________________
   _________________________________
   _________________________________
**Stars Answer Key**

**Big Universe** (page 76)
1. planets
2. stars
3. galaxies
4. universe
Illustrations will vary.

**All Kinds of Stars** (page 77)
Red dwarf colored red; big; bright
Yellow star colored yellow; bigger; brighter
Blue giant colored blue; biggest; brightest

**Earth’s Closest Star** (page 78)
1. red dwarf star
2. blue giant star
3. red dwarf
4. blue giant
5. super giant star
Illustrations will vary, but students should show correct size relationships between our sun and other types of stars.

**Reader Quiz** (page 79)
1. a
2. b
3. a
4. c
5. Answers and pictures will vary. Students should have compared two stars by color, size, and brightness.