Lesson 3.4
Dog Days of Summer
Lesson Overview

Students read and then apply ideas from the reading to the physical classroom model. To begin, students read *Dog Days of Summer* with a partner, using the strategy of visualizing to help them understand the complex ideas in the text. They then apply what they learned about the Dog Star to discuss where that star would be located in the classroom model. Students consider the yearly patterns of when constellations are visible and use the classroom model to reflect on what constellations and stars, including the Dog Star, are visible at what times of year. They refer to a still image of Sky View in the *Patterns of Earth and Sky* Simulation to verify their placement of the Dog Star. The purpose of this lesson is to reinforce the yearly patterns of when we can see particular constellations, using the Dog Star as a focus for reading text and modeling the yearly pattern.

**Anchor Phenomenon:** Different sections of an ancient artifact show what the sky looked like from one location and depict different stars.

**Investigative Phenomenon:** There is a yearly pattern of which stars and constellations are visible in the sky.

**Students learn:**

- Earth’s position in its yearly orbit determines which stars we see in the night sky.
- People long ago observed the stars and used yearly star patterns to help them track different times of year.
- Visualizing when you read can help you understand things that are difficult to observe.
Introducing Dog Days of Summer

Students are introduced to Dog Days of Summer. They are reminded to use the strategy of visualizing while they read.

Instructional Guide

1. **Introduce Dog Days of Summer.** Let students know that this book will help them learn more about the Investigation Question, *What causes the yearly pattern of stars that we see?*

2. **Designate reading partners and distribute one copy of the book to each pair.**

3. **Prepare students to visualize by modeling with pages 4–5.** Ask students to turn to page 4.

   • **Say:** Remember, we used the strategy of visualizing as we read to help us understand what was in the text. We also visualized to help us understand our models. We will visualize again as we read Dog Days of Summer. Read along with me and try to visualize what is being described in the text.

   • **Read page 4 aloud and discuss what students visualized.** Call on several students to share what they visualized. If necessary, prompt them to think about how they would look and feel and what kinds of things they do on very hot days.

   • **Read the first paragraph on page 5 aloud and discuss Orion moving across the sky.**
     
     **Say:** I need to visualize to understand this. I read that as Earth spins, the stars of Orion cross the sky, rising in the east and setting in the west. What does that mean?
     
     **Say:** Earth spins so slowly that it is not easy to observe how the stars we can see change. It would take observing for many hours on many different days.
     
     **Say:** Maybe I can use the words and the diagram here to make a movie in my mind. I know from the Sim that as Earth spins, it seems like constellations move across the sky. I am visualizing Earth slowly spinning, causing what I see in the sky to change. I am visualizing Orion and how Orion seems to move across the sky, just like I observed that constellations appear to “move” in the Sim.

   • **Ask students to visualize what you just described.**
     
     **Say:** Making a movie in your mind will help you understand things that are difficult to observe.
Teacher Support

Instructional Suggestion

Providing More Experience: Today’s Daily Written Reflection
List two examples of things that spin. List two examples of things that orbit. This prompt (on page 52 in the Investigation Notebook) asks students to think about what they already know about the concepts of spin and orbit. Accessing prior knowledge and connecting to familiar experiences can help support students in grasping new science concepts.

Background

About the Book: Dog Days of Summer
As they get to know Sirius, the Dog Star, students are introduced to several important concepts in Dog Days of Summer. They learn what a constellation is, the names of a few specific constellations, and some features of the brightest star in the night sky. Students read about astronomy ideas from ancient times that have been disproven through observation and investigation and how the Dog Star served as a guide to important events in the lives of ancient people. The book also explains why particular stars are visible during some parts of the year, but not others—it’s all due to Earth’s orbit. Dog Days of Summer helps students understand content about stars and constellations, as well as historical ideas in astronomy.

Literacy Note: Visualizing for Different Purposes

There are a variety of purposes for using the visualizing strategy as you read. In Chapter 1, students visualized in order to understand size and distance as they read How Big Is Big? How Far Is Far? In Chapter 2, students visualized in order to understand motion—specifically, how Earth spins and how this affects which direction is up. In this lesson, students focus on visualizing in order to understand things that are difficult to observe, such as constellations appearing to move across the sky. Of course, an experienced reader might visualize for a variety of purposes within each of these books. However, focusing students on one aspect of visualizing for each of the first three chapters allows them the opportunity to build their understanding of and facility with using the strategy over time. In Chapter 4, students are encouraged to visualize in whatever way is most useful to them.

Literacy Note: Different Techniques for Visualizing

There are a variety of ways to visualize as you read. In Chapters 1 and 2, we focused students on using the text and/or diagrams to make either a still picture or a movie in their minds. In this lesson, students are encouraged to add another layer to that by connecting to investigations in the Sim. Since the Simulation is a visual model, it is a great resource for students as they attempt to visualize and understand the text.
Partner Reading

Students read *Dog Days of Summer* and use the sense-making strategy of visualizing.

**Instructional Guide**

1. **Distribute three sticky notes to each student.** Let students know that they should place a sticky note on each page where they used the strategy of visualizing. Explain that after they read, they can refer to their sticky notes to talk about what they visualized.

2. **Pairs read.** Circulate to provide support and help students focus on the main content of the book.

3. **Pairs discuss visualizing.** Have each student choose one place in the book where they visualized. Ask pairs to discuss what they visualized and how it helped them understand the text. If there is time, call on several students to share how they used the visualizing strategy.

4. **On-the-Fly Assessment: Visualizing as a Sense-Making Strategy.** As partners share, circulate to listen to how students are discussing their use of the sense-making strategy of visualizing. Press the hummingbird icon and select ON-THE-FLY ASSESSMENT for details about what to look for and how you can use the information to maximize learning by all students.

5. **Have a whole-class discussion about when the Dog Star is visible and why.** Encourage students to refer to the book, as necessary.

   - *When is the Dog Star easiest to see in the sky?* [It is most visible in winter, in January.]
   - *When is it not visible?* [It is not visible in July.]
   - *How did visualizing help you understand why the Dog Star is not easy to see in summer?* [We can’t see the Dog Star in summer because as Earth spins, we face toward it during the day when the sun is up and the Dog Star is on the other side of the sun from Earth. I used visualization to imagine Earth orbiting to the point where the Dog Star was on the other side of the sun from Earth, and then I visualized Earth spinning so we face the sun and the Dog Star at the same time.]

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Embedded Formative Assessment

On-the-Fly Assessment 11: Visualizing as a Sense-Making Strategy

Look for: At this point in the unit, students have had several opportunities to visualize ideas as they read, as well as when they investigate. As students read *Dog Days of Summer*, they are encouraged to focus on visualizing things that are difficult to observe and to use the visuals in the Sim for inspiration. As students discuss their visualizations after reading, take note of how students are describing their visualizations. Are they able to use both the text and the diagrams to visualize? Are they visualizing how Earth moves? Are they able to use the Sim to help them visualize?

Now what? If students are having trouble visualizing, you can provide additional support by modeling visualizing with another example. Have students turn to page 11. Read the first paragraph aloud, and then draw students' attention to the diagram. Point out that the text you just read describes movement, but the diagram can't show Earth moving. However, the diagram gives you a starting point for visualizing how Earth moves. Think aloud as you visualize Earth orbiting the sun. Continue reading and point out the second diagram. Again, describe a visualization of Earth moving around the sun to a new position. You can say something like, “I am making a movie in my head, and I am thinking about the Sim as I do that. I saw Earth orbit around the sun in the Sim, and I think that’s what is happening here, too.” In addition, you could project the Sim and demonstrate Earth orbiting around the sun so students can see the images you used in your visualization.