Lesson 2.3
Introducing Modeling
Lesson Overview

Students make the first in a series of models to explain animal and plant defenses. Partners explore the reference book to observe how animals and plants use their structures to not be eaten. Students reflect on what they observed in the reference book before using a ball of clay, a comb, and a variety of materials to model how animals and plants might use their structures to defend themselves. The teacher demonstrates how to draw a model structure in the Investigation Notebook and how to use the word ring to label the drawing. Then, students choose one of their model structures to draw and label in their notebooks. The teacher introduces the scientific practice of modeling and uses the Models of Animal and Plant Defenses chart to record what the class learned from each model they created. The purpose of this lesson is to provide a foundational modeling experience upon which students can build as they learn more about animal and plant defenses throughout Chapter 2.

Anchor phenomenon: Spruce the Sea Turtle will survive in the ocean.
Investigative phenomenon: Animals can avoid being eaten.

Students learn:

- There are many different ways that animals and plants defend themselves from being eaten.
- Models are something scientists make to answer questions about the real world.
- Scientists use drawings, sketches, and models as a way to communicate ideas.
Exploring Defenses in Spikes, Spines, and Shells

Partners browse *Spikes, Spines, and Shells* to think about how animals and plants use their structures to not be eaten.

**Instructional Guide**

1. **Revisit the Chapter 2 Question.** Point to the Chapter 2 Question on the wall.

   - We have been working as aquarium scientists to answer this question: *How can Spruce the Sea Turtle survive where there are sharks?*

   - Just like other predators, sharks eat animals by finding them and using sharp structures, such as their teeth, to catch them or break them into smaller pieces.

2. **Introduce the new Investigation Question.**

   - We want to figure out how Spruce the Sea Turtle can defend herself from sharks.

   - To help us figure out how Spruce can defend herself, we need to learn about the ways different living things defend themselves. Then, we can use what we learn to think about how Spruce might defend herself in some of the same ways.

   Point to the Investigation Question and read it aloud.

   - How do animals and plants defend themselves?

3. **Introduce the word *defend* with the vocabulary routine.** Hold up the *defend* vocabulary card.

   - This is the word *defend*. To defend is to protect or keep safe.

   - We are going to practice saying the word. Say the word after me: *defend.*
Now say the word together: *defend*.

Now whisper the word *defend* to your partner.

To defend is to protect or keep safe.

Post the *defend* vocabulary card to the Vocabulary section of the classroom wall.


*Spikes, Spines, and Shells* is our reference book. We have observed the pictures in this book once before to help us think about how animals and plants use their structures to do what they need to do to survive.

5. Set a new purpose for exploring the reference book.

Now we will use this book to gather information to help answer our question about how animals and plants defend themselves.

You and your partner will work together to observe the pictures in the book again. This time, you and your partner will visualize how the animals and plants in the book use their structures to not be eaten.

6. Review the Partner Reading Guidelines. Invite a volunteer to be your reading partner. Read each guideline aloud and model the corresponding behavior with a partner.

   • Sit next to your partner.
   • Put the book between you.
   • Work together to read and understand. (This is modeled in Step 7.)

7. Model observing, visualizing, and identifying a possible defense. Invite a volunteer to be your partner. Turn to page 30 and point to the crown of thorns picture on this page. Say the following to your partner:

   I see sharp thorns on this plant. I am visualizing an animal trying to bite this plant.

   I think the sharp thorns would poke the animal in the mouth. I think the thorns would keep an animal from being able to eat this plant.

   I think one way that animals and plants can defend themselves is by having sharp structures like these thorns.

Encourage your partner to share any additional observations about the plant in the picture.

8. Distribute copies of *Spines, Spikes, and Shells*. Distribute one copy of the book to each pair of students and have partners begin browsing. Remind students that they are visualizing and thinking about how the animals and plants in the book use their structures to not be eaten.
9. Provide partners with time to browse. Circulate and observe as partners browse and discuss the images in the book.

10. Call on volunteers to share with the class. Invite a few volunteers to share what they noticed as they browsed.

11. Collect the books.

Teacher Support

Background

Literacy Note: About the Reference Book in This Lesson
Reference books provide in-depth information about specific topics and are typically read for particular purposes. For this reason, students do not read every section in reference books, nor do they read reference books from beginning to end. Rather, they search for the information they need and then read the relevant sections carefully. In this lesson, students will be asked to use the reference book to gather information to help answer the question: How do animals and plants defend themselves? Pairs will work together to observe the pictures in the book, this time visualizing how the animals and plants in the book use their structures to not be eaten.

Instructional Suggestion

Supporting Discussions: Using Vocabulary
Encourage students to use key vocabulary as they read the reference book with their partner. Appropriate new vocabulary words include the words predator and defend. As needed, ask students specific questions to encourage their vocabulary use, such as What is one way you think the animal or plant can defend itself? Ask students to use the target words in their answers, as they would if they were learning and practicing any new language.
Exploring Defenses in Spikes, Spines, and Shells

Partners browse *Spikes, Spines, and Shells* to think about how animals and plants use their structures to not be eaten.

**Instructional Guide**

1. **Revisit the Chapter 2 Question.** Point to the Chapter 2 Question on the wall.

   - Hemos estado trabajando como científicos y científicas de acuarios para responder esta pregunta: ¿Cómo es que Spruce la tortuga de mar puede sobrevivir donde hay tiburones?

   - Tal como otros depredadores, los tiburones comen animales encontrándolos y usando estructuras afiladas, como sus dientes, para atraparlos o romperlos en pedazos más pequeños.

2. **Introduce the new Investigation Question.**

   - Estamos intentando averiguar cómo Spruce la tortuga de mar puede defenderse de los tiburones.

   - Para ayudarnos a averiguar cómo se puede defender Spruce, necesitamos aprender acerca de las maneras en que diferentes seres vivientes se defienden. Luego, podemos usar lo que aprendamos para pensar en cómo Spruce podría defenderse en algunas de las mismas maneras.

   Point to the Investigation Question and read it aloud.

   - ¿Cómo se defienden los animales y las plantas?

3. **Introduce the word defend with the vocabulary routine.** Hold up the *defend* vocabulary card.

   - Esta es la palabra *defender*. Defender es proteger o mantener seguro.

   - Vamos a practicar decir la palabra. Digan la palabra después de mí: *defender*.
Ahora digan la palabra juntos: *defender*.

Ahora susurren la palabra *defender* a su compañero o compañera.

Defender es proteger o mantener seguro.

Post the *defend* vocabulary card to the Vocabulary section of the classroom wall.


*Puas, corazas y otras partes protectoras* es nuestro libro de referencia. Hemos observado las imágenes en este libro una vez anteriormente para ayudarnos a pensar en cómo los animales y las plantas usan sus estructuras para hacer lo que necesitan hacer para sobrevivir.

5. Set a new purpose for exploring the reference book.

Ahora usaremos este libro para reunir información para ayudar a responder nuestra pregunta acerca de cómo se defienden los animales y las plantas.

| Trabajarán juntos para observar las fotos en el libro de nuevo. Esta vez, visualizarán cómo los animales y las plantas en el libro usan sus estructuras para no ser comidos.

6. Review the Partner Reading Guidelines. Invite a volunteer to be your reading partner. Read each guideline aloud and model the corresponding behavior with a partner.

- Sit next to your partner.
- Put the book between you.
- Work together to read and understand. (This is modeled in Step 7.)

7. Model observing, visualizing, and identifying a possible defense. Invite a volunteer to be your partner. Turn to page 30 and point to the crown of thorns picture on this page. Say the following to your partner:

Veo espinas afiladas en esta planta. Estoy visualizando un animal intentando morder esta planta.

Pienso que las espinas afiladas se clavarían en la boca del animal. Pienso que las espinas evitarían que un animal pudiera comer esta planta.

Pienso que una manera en que los animales y las plantas pueden defenderse es teniendo estructuras afiladas como estas espinas.

Encourage your partner to share any additional observations about the plant in the picture.
8. Distribute copies of *Spines, Spikes, and Shells*. Distribute one copy of the book to each pair of students and have partners begin browsing. Remind students that they are visualizing and thinking about how the animals and plants in the book use their structures to not be eaten.

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