Lesson 3.5
Plant and Animal Interdependence
In this lesson, students continue to explore seed dispersal as they investigate how plants and animals depend on each other in different habitats. First, students locate the seeds they hid in Lesson 3.1, discuss how chipmunks disperse pine tree seeds by hiding and forgetting them, and explain how the pine tree and chipmunks depend on each. Then, students investigate the plant and animal relationships in the three habitats from the Modeling Tool. They use information from Handbook of Habitats to determine how the seeds in each habitat are dispersed. Finally, students write about how a plant and an animal in a habitat depend on each other. The purpose of this lesson is for students to deepen their understanding of plant and animal interdependence as they investigate more examples of seed dispersal.

**Anchor phenomenon:** No new chalta trees are growing in the Bengal Tiger Reserve in India.  
**Investigative phenomenon:** Seeds can get to new places in a habitat.

**Students learn:**

- Some plants depend on animals to disperse their seeds. These animals depend on the plants for food.
Students determine a purpose for reading. The teacher models how to gather information from the reference book.

Instructional Guide

1. Discuss habitats that students have investigated.

- So far, we have investigated a mountain habitat and the broadleaf forest habitat.
- We’ve also investigated habitats in our digital tool. We have investigated city park, desert, and everglades habitats in our app.
- Just like the seeds in other habitats, the seeds in these habitats need to get dispersed. Let’s investigate to find out if animals disperse seeds in these habitats, too.

2. Project Plant Growth: City Park and introduce acorns. Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 1, 2.4 Plant Growth: City Park. Have students observe the city park. Point out the acorns, which are seeds of oak trees.

3. Hold up Handbook of Habitats. Let students know they will investigate by reading sections of the Handbook.

4. Project notebook page 51. Have students turn to page 51, Seed Dispersal in Different Habitats, in the Investigation Notebook. Have students follow along as you read the directions aloud.

5. Set a purpose for reading.

- Today we aren’t reading the Handbook of Habitats to learn about a new habitat. Instead, we are reading to figure out if animals disperse seeds in different habitats.

On the Setting a Purpose chart, write, “Figure out if animals disperse seeds in different habitats.”

How could we find out what part of the book talks about the city park?
[We could look at the Table of Contents.]

What page does the Table of Contents tell us to turn to if we want to read about a city park?
[Page 40.]

We can use the headings within the section to help us figure out which part of the section to read, instead of reading the whole section.

Give students time to flip through the section and notice the section titles.

What section might be helpful for us to read to learn about animals in the habitat, and whether or not they might disperse seeds?
[The City Park Animals section on page 44.]

7. Model filling in the table on projected notebook page 51. Turn to City Park Animals on page 44. Read the paragraph about squirrels aloud.

This section says that squirrels eat acorns and hide them in their habitat. How do you think acorns are dispersed?
[Squirrels hide and forget them.]

Some students may suggest that squirrels eat acorns and leave droppings with seeds in them. If students mention this, point out that squirrels actually break apart the seeds rather than swallowing them whole, so the common way they disperse seeds is when they hide them and forget them.

We learned that animals can hide and forget about seeds in our Hiding Seeds model. Also, we read in Habitat Scientist that another animal—the chipmunk—hides and forgets about pine tree seeds, and that’s how those seeds can grow into new trees.

Write “squirrels hide and forget them” in the third column of the City Park row on the notebook page. Have students copy this statement in their own notebooks.

Teacher Support

Background

Literacy Note: About Text Features
Text features are the visual elements of a text that are used to organize information and highlight important ideas. Text features include headings, tables of contents, bold print, illustrations, captions, graphs, etc. Learning to use these features is a strategy that students can employ to locate and make sense of information in nonfiction texts. In the Plant and Animal Relationships unit, students have multiple opportunities to use the contents page of the book and the headings and sub-headings within the sections. They learn that these text features are important elements of texts that help to organize information in the text for easy reference.
Seed Dispersal in Different Habitats

Students use their reference books to determine which animals might disperse certain seeds in the Desert and Everglades habitats.

Instructional Guide

1. **Project Plant Growth: Desert** to introduce mesquite. Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 2, 2.4 Plant Growth: Desert. Have students observe the desert. Point out the mesquite tree seeds.

   Now let’s find out how animals disperse the mesquite tree seeds.

2. **Pairs find information about seed dispersal in the desert.** Have students use the Contents to locate the “Desert” section on page 34, and the headings to locate the “Sonoran Desert Animals” section on page 38. Students work with their partners to complete the next row of the table.

3. **Project Plant Growth: Everglades** to introduce gumbo-limbo trees. Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 3, 2.5 Plant Growth: Everglades. Have students observe the everglades. Point out the gumbo-limbo tree seeds.

   Now let’s find out how animals disperse the gumbo-limbo tree seeds.

4. **Students complete notebook page 51.** Have students find information in the reference book to help them complete the notebook page.

5. **On-the-Fly Assessment: Students complete notebook page about how seeds are dispersed.** As students complete the notebook page, circulate and listen for students’ understanding of how to determine how animals can disperse seeds in a habitat.

6. **Invite students’ questions.** Have students think for a minute about what questions they still have about how plants and animals depend on each other in habitats, then call on a few volunteers to share questions.
7. Share out. Ask students to share what they wrote in each section and explain their ideas.

- How do you think the seeds of mesquite trees are dispersed? Why do you think so?
  [Coyotes and mule deer eat the seeds, move to another place, and then leave droppings with the seeds inside.]

- What evidence do you have for that idea?
  [The reference book says that coyotes and mule deer eat mesquite seed pods.]

- How do you think the gumbo-limbo seeds are dispersed?
  [Vireos eat the seeds, move to another place, and then leave droppings with the seeds inside.]

- What evidence do you have for that idea?
  [The reference book says that vireos eat gumbo-limbo seeds.]

Embedded Formative Assessment

On-the-Fly Assessment 11: Determining How Seeds Are Dispersed

Look for: As students complete their notebook pages, circulate and listen for how students determine the method of seed dispersal in each example. Do students make the connection between animal needs and how seeds are dispersed? Can students apply the key concept they constructed during the Dispersing Seeds Model to additional plant-animal relationships?

Now what? If students have trouble explaining how the seeds in each habitat are dispersed, guide students through another example. For instance, read aloud the Sonoran Desert Animals section of Handbook of Habitats and model identifying which animals might disperse seeds by identifying the animals that eat the mesquite tree pods. [Coyotes and mule deer.] Then, point to the posted key concept and ask students to apply that idea to the coyotes and the mesquite tree seeds. Model how to put those ideas together by stating, “I know that coyotes eat mesquite seeds, so I think that coyotes eat the seeds, move to another place, and then leave droppings with the seeds inside. The coyotes disperse the seeds.”

Teacher Support

Instructional Suggestion

Classroom Management: Early Finishers
If you find that some students need more time than others to locate information in Handbook of Habitats and complete their notebook page, you can have early finishers use the extra time to browse the sections of the book. You might consider having these students come up with an additional plant and animal relationship in the habitat they are investigating. Encourage these students to consider how other plants and animals in the habitat depend on each other.
Instructional Suggestion

Providing More Support: Understanding Evidence
If you feel that your students do not have a strong understanding of the concept of evidence and its role in science, you might want to take a few extra minutes to draw on students’ background knowledge of the word *evidence*. Many students know the word *evidence* from television or books that describe mysteries or crimes. You can draw on this everyday knowledge to offer analogous examples that will help make students’ experiences with scientific evidence more accessible. You might also provide an example argument based on a familiar context: What happened to the caterpillar? Provide two sample claims: *The caterpillar crawled away* or *The caterpillar changed into a butterfly*. Then explain the evidence: an empty chrysalis left behind, a butterfly laying eggs on a leaf, no caterpillars in sight. A familiar context can help students focus on how evidence can be used to support their claims.

Possible Responses

Investigation Notebook
Seed Dispersal in Different Habitats (page 51)

My purpose for reading is to figure out if animals disperse seeds in different habitats.

City Park/Acorn: Squirrels hide and forget them.

Desert/Mesquite: Coyotes and mule deer eat the seeds, move to another place, and then leave droppings with the seeds inside.

Everglades/Gumbo-limbo: Vireos eat the seeds, move to another place, and then leave droppings with the seeds inside.
Writing About Seed Dispersal

Directions:
1. Pick one habitat below.
2. Complete the sentences about that habitat by using information you gathered from *Handbook of Habitats*.

**City Park Habitat**

The oak tree depends on __________________________ to __________________________.

The squirrel depends on __________________________ to __________________________.

**Desert Habitat**

The mesquite tree depends on __________________________ to __________________________.

The coyote depends on __________________________ to __________________________.

**Everglades Habitat**

The gumbo-limbo tree depends on __________________________ to __________________________.

The vireo depends on __________________________ to __________________________.
Seed Dispersal in a City Park

Students determine a purpose for reading. The teacher models how to gather information from the reference book.

Instructional Guide

1. Discuss habitats that students have investigated.

- Until now, we have investigated a mountain habitat and the habitat of a broad-leaved forest. We have also investigated habitats in our digital tool. We have investigated the habitats of city parks, deserts, and Everglades in our application.

- Likewise, seeds in other habitats need to be dispersed. Let’s investigate to find out if animals also disperse seeds in these habitats.

2. Project Plant Growth: City Park and introduce acorns. Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 1. 2.4 Plant Growth: City Park. Have students observe the city park. Point out the acorns, which are seeds of oak trees.

3. Hold up Handbook of Habitats. Let students know they will investigate by reading sections of the Handbook.

4. Project notebook page 51. Have students turn to page 51, Seed Dispersal in Different Habitats. in the Investigation Notebook. Have students follow along as you read the directions aloud.

5. Set a purpose for reading.

- Today, we are not going to read the Manual of Habitats to learn about a new habitat. Instead, we are going to read to find out if animals disperse seeds in different habitats.

On the Setting a Purpose chart, write, “Figure out if animals disperse seeds in different habitats.”

Give students time to flip through the section and notice the section titles.

¿Cómo podríamos averiguar qué parte del libro habla acerca del parque de la ciudad? [Podríamos mirar el Contenido].

¿A qué página nos dice el Contenido que pasemos si queremos leer acerca de un parque de la ciudad? [Página 40].

Podemos usar los encabezados dentro de la sección para ayudarnos a averiguar qué parte de la sección leer, en lugar de leer toda la sección.

Some students may suggest that squirrels eat acorns and leave droppings with seeds in them. If students mention this, point out that squirrels actually break apart the seeds rather than swallowing them whole, so the common way they disperse seeds is when they hide them and forget them.

¿Qué sección podría ser útil que leyéramos para aprender acerca de los animales en el hábitat, y si podrían o no dispersar las semillas? [La sección Animales de parques de la ciudad en la página 44].

7. Model filling in the table on projected notebook page 51. Turn to City Park Animals on page 44. Read the paragraph about squirrels aloud.

Esta sección dice que las ardillas comen bellotas y las ocultan en su hábitat. ¿Cómo piensan que se dispersan las bellotas? [Las ardillas las ocultan y se olvidan de ellas].

Some students may suggest that squirrels eat acorns and leave droppings with seeds in them. If students mention this, point out that squirrels actually break apart the seeds rather than swallowing them whole, so the common way they disperse seeds is when they hide them and forget them.

Aprendimos que los animales pueden ocultar semillas y olvidarse de ellas en nuestro Modelo de ocultar semillas. También, leímos en Científico de hábitats que otro animal (la ardilla rayada) oculta y olvida semillas de pino, y así esas semillas pueden crecer y convertirse en árboles nuevos.

Write “squirrels hide and forget them” in the third column of the City Park row on the notebook page. Have students copy this statement in their own notebooks.

Teacher Support

Background

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Students use their reference books to determine which animals might disperse certain seeds in the Desert and Everglades habitats.

Instructional Guide

1. Project Plant Growth: Desert to introduce mesquite. Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 2, 2.4 Plant Growth: Desert. Have students observe the desert. Point out the mesquite tree seeds.

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3. Project Plant Growth: Everglades to introduce gumbo-limbo trees. Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 3, 2.5 Plant Growth: Everglades. Have students observe the everglades. Point out the gumbo-limbo tree seeds.

4. Students complete notebook page 51. Have students find information in the reference book to help them complete the notebook page.

5. On-the-Fly Assessment: Students complete notebook page about how seeds are dispersed. As students complete the notebook page, circulate and listen for students’ understanding of how to determine how animals can disperse seeds in a habitat.

6. Invite students’ questions. Have students think for a minute about what questions they still have about how plants and animals depend on each other in habitats, then call on a few volunteers to share questions.
7. Share out. Ask students to share what they wrote in each section and explain their ideas.

- ¿Cómo piensan que se dispersan las semillas de los mezquites? ¿Por qué piensan eso?
  [Los coyotes y los ciervos mulos comen las semillas, se mueven a otro lugar y luego dejan heces con las semillas dentro.]

- ¿Qué evidencia tienen para esa idea?
  [El libro de referencia dice que los coyotes y los ciervos mulos comen vainas de semillas de mezquite.]

- ¿Cómo piensan que se dispersan las semillas de los jiotes?
  [Los víreos comen las semillas, se mueven a otro lugar y luego dejan heces con las semillas dentro.]

- ¿Qué evidencia tienen para esa idea?
  [El libro de referencia dice que los víreos comen semillas de jiote.]

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**Embedded Formative Assessment**

**On-the-Fly Assessment 1: Determining How Seeds Are Dispersed**

**Look for:** As students complete their notebook pages, circulate and listen for how students determine the method of seed dispersal in each example. Do students make the connection between animal needs and how seeds are dispersed? Can students apply the key concept they constructed during the Dispersing Seeds Model to additional plant-animal relationships?

**Now what?** If students have trouble explaining how the seeds in each habitat are dispersed, guide students through another example. For instance, read aloud the Sonoran Desert Animals section of *Handbook of Habitats* and model identifying which animals might disperse seeds by identifying the animals that eat the mesquite tree pods. [Coyotes and mule deer.] Then, point to the posted key concept and ask students to apply that idea to the coyotes and the mesquite tree seeds. Model how to put those ideas together by stating, “I know that coyotes eat mesquite seeds, so I think that coyotes eat the seeds, move to another place, and then leave droppings with the seeds inside. The coyotes disperse the seeds.”

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**Teacher Support**

**Instructional Suggestion**

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If you find that some students need more time than others to locate information in *Handbook of Habitats* and complete their notebook page, you can have early finishers use the extra time to browse the sections of the book. You might consider having these students come up with an additional plant and animal relationship in the habitat they are investigating. Encourage these students to consider how other plants and animals in the habitat depend on each other.
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Everglades/Gumbo-limbo: Vireos eat the seeds, move to another place, and then leave droppings with the seeds inside.
Escribir sobre la dispersión de semillas

Instrucciones:
1. Escoge uno de los hábitats debajo.
2. Completa las oraciones sobre ese hábitat usando información que recolectaste en el Manual de hábitats.

Hábitat del parque de la ciudad

El roble depende de ____________________________________________ para _____________________________________________________________.
La ardilla depende de ____________________________________________ para _____________________________________________________________.

Hábitat del desierto

El árbol de mezquite depende de ____________________________________ para _____________________________________________________________.
El coyote depende de ____________________________________________ para _____________________________________________________________.

Hábitat de los Everglades

El árbol de jiote depende de ____________________________________________ para _____________________________________________________________.
El víreo depende de ____________________________________________ para _____________________________________________________________.

Nombre: ____________________________________  Fecha: ________________