Lesson 2.4
Finding a Good Place to Grow
Lesson Overview

Students continue to investigate the question, Why can’t plants always get the sunlight and water they need to grow? As they explore a city park and a desert habitat in a digital app, students engage with the idea that seeds cannot grow in areas where they are competing with other plants’ roots for water or in areas where they cannot get enough sunlight because they are blocked by other plants’ leaves. Students then apply that understanding by adding to a diagram of a habitat in their notebooks and discussing with a partner why some locations are good places for a new plant to grow while others are not. This activity serves as the first part of the two-part Chapter 2 Critical Juncture Assessment. (The second part, in Lesson 2.5, is a written explanation on the same topic.) Finally, students consider what they have learned in the context of the Bengal Tiger Reserve and identify places where new seeds could grow in the Reserve. The purpose of this lesson is for students to construct and deepen their understanding that plants need space away from other plants in order to get the water and sunlight that they need to grow.

Anchor phenomenon: No new chalta trees are growing in the Bengal Tiger Reserve in India.
Investigative phenomenon: Seeds can or cannot grow in different habitats.

Students learn:

- Without enough space, plants can’t get sunlight and water they need to grow.
- Leaves need space to get sunlight. Roots need space in the soil to get water.
A Good Place to Grow in the Desert

Students read about unfamiliar seeds in *Handbook of Habitats* before investigating another habitat in the digital app.

Instructional Guide

1. **Project 2.4 Plant Growth: Desert.** Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 2.4 Plant Growth: Desert. Remind students of the features of the Modeling Tool and point out how this activity is different from the City Park activity.

   - Select INSTRUCTIONS at the top left of the screen and read aloud the instructions. Point out that these instructions are also listed at the top of the screen.
   - Point out the key with information about the habitat.
   - Point out the mesquite seeds (which can be dragged onto the image of the desert).
   - Point out the RESET, UNDO, and REDO buttons at the top right.

   Before we investigate this level more closely, let’s find out more about mesquite trees in this desert. We can find out more about mesquite trees in *Handbook of Habitats*.

   Keep the app projected.

2. **Distribute books and have pairs turn to the Contents.** Turn to the Contents and have students look for a section about a desert. Turn to the "Sonoran Desert" section on page 34. Read the introduction of the section as a class.

3. **Have pairs read about mesquite trees.** Have pairs find the page that talks about mesquite trees (page 36) and read the section.

   What does the reference book tell us about mesquite trees?

   [Mesquite trees are small trees that grow deep roots and have leaves made of small leaflets. The flowers are small and yellow and grow in clusters. The seeds form in pods that are eaten by many animals.]
4. Return to the projection and orient students to how roots are shown. Have students set aside their books and draw their attention to the projected app. Drag a seed to a location where it will grow. Explain to students that the cactus roots in the desert are underground but are shown in this model to help them investigate good places for new plants to grow.

5. Students return to digital devices. Have students open 2.4 Plant Growth: Desert. Have pairs determine where mesquite seeds can and cannot grow in the app.

6. Discuss what students found out. Ask students for ideas about why seeds grow in some places and not other places. Help students explore the idea that plants need space away from other plants to grow.

Teacher Support

Instructional Suggestion

Technology Note: Understanding the Plant Growth: Desert Activity in the Modeling Tool
The Desert activity of the Modeling Tool has unique features from the City Park activity that are worth reviewing with students prior to investigating. First, call attention to the features of 2.4 Plant Growth: Desert that are similar to 2.4 Plant Growth: City Park, such as the areas of shade around the mesquite trees and cactus. Then, examine the cactus roots with students. Explain to students that cactus roots, like most other roots, grow underground, but are shown in this model so they can investigate where a good place would be for a new plant to grow.

Possible Responses

Now let’s explore where mesquite trees will and will not grow in the model.

Where did the mesquite seeds grow? Why do you think they could grow there?
[In the desert sand, because they could get sunlight on their leaves and spread their roots to get water.]

Where did the mesquite seeds not grow? Why do you think they could not grow there?
[In the shadows of other trees because they could not get sunlight on their leaves, and in the roots of the cactus and on the rock because they could not spread their roots to get water.]
Students should notice that plants need space to get the sunlight and water they need to grow. By placing mesquite seeds in the shade of trees or the shade of the cactus, students should see that mesquite seeds will not grow into trees when sunlight is blocked by another plant. By placing mesquite seeds on or adjacent to the rock or cactus roots, students should see that mesquite seeds will not grow into mesquite trees when they cannot grow roots to get water. By placing mesquite seeds on the sand, in sunny areas that are not too close to the rock, roots, cactus, or other trees, students should see that new trees can grow when sunlight is not blocked by another plant and when there is space to grow roots to get water from the soil.
Students read about unfamiliar seeds in *Handbook of Habitats* before investigating another habitat in the digital app.

**Instructional Guide**

1. **Project 2.4 Plant Growth: Desert.** Go to the Student Apps Page and select Plant and Animal Relationships. Then, select Box 2, 2.4 Plant Growth: Desert. Remind students of the features of the Modeling Tool and point out how this activity is different from the City Park activity.

   - Select INSTRUCTIONS at the top left of the screen and read aloud the instructions. Point out that these instructions are also listed at the top of the screen.
   - Point out the key with information about the habitat.
   - Point out the mesquite seeds (which can be dragged onto the image of the desert).
   - Point out the RESET, UNDO, and REDO buttons at the top right.

   Antes de que investiguemos este nivel más detenidamente, averigüemos más acerca de los árboles de mezquite en este desierto. Podemos averiguar más acerca de los mezquites en el *Manual de hábitats*.

   Keep the app projected.

2. **Distribute books and have pairs turn to the Contents.** Turn to the Contents and have students look for a section about a desert. Turn to the "Sonoran Desert" section on page 34. Read the introduction of the section as a class.

3. **Have pairs read about mesquite trees.** Have pairs find the page that talks about mesquite trees (page 36) and read the section.
4. Return to the projection and orient students to how roots are shown. Have students set aside their books and draw their attention to the projected app. Drag a seed to a location where it will grow. Explain to students that the cactus roots in the desert are underground but are shown in this model to help them investigate good places for new plants to grow.

5. Students return to digital devices. Have students open 2.4 Plant Growth: Desert. Have pairs determine where mesquite seeds can and cannot grow in the app.

6. Discuss what students found out. Ask students for ideas about why seeds grow in some places and not other places. Help students explore the idea that plants need space away from other plants to grow.

Teacher Support

Instructional Suggestion

Technology Note: Understanding the Plant Growth: Desert Activity in the Modeling Tool
The Desert activity of the Modeling Tool has unique features from the City Park activity that are worth reviewing with students prior to investigating. First, call attention to the features of 2.4 Plant Growth: Desert that are similar to 2.4 Plant Growth: City Park, such as the areas of shade around the mesquite trees and cactus. Then, examine the cactus roots with students. Explain to students that cactus roots, like most other roots, grow underground, but are shown in this model so they can investigate where a good place would be for a new plant to grow.
Possible Responses

*Plant and Animal Relationships* Modeling Tool

2.4 Plant Growth: Desert

What students should do and notice:

Students should notice that plants need space to get the sunlight and water they need to grow. By placing mesquite seeds in the shade of trees or the shade of the cactus, students should see that mesquite seeds will not grow into trees when sunlight is blocked by another plant. By placing mesquite seeds on or adjacent to the rock or cactus roots, students should see that mesquite seeds will not grow into mesquite trees when they cannot grow roots to get water. By placing mesquite seeds on the sand, in sunny areas that are not too close to the rock, roots, cactus, or other trees, students should see that new trees can grow when sunlight is not blocked by another plant and when there is space to grow roots to get water from the soil.