

**Focus:** Plant Adaptations

**Grade Level:** 3-5

**Session Length:** Four activities of 25-30 minutes each

### Driving Questions

- What do plants need to survive?
- Which water-saving adaptations help plants survive in hot and dry environments?

*During Week 3: Plant Adaptations, students investigate water-saving adaptations of plants to help a Crystal Cove Conservancy employee determine which type of plant is best adapted to survive in Moro Canyon's hot and dry environment.*

On Day 1, a breaking news story introduces the students to a Crystal Cove Conservancy employee who needs the students' help to determine which type of plant is best adapted to survive in Moro Canyon's hot and dry environment and students. Next, brainstorm ideas for what plants need to survive. On Day 2, students walk around their school to observe plants and use a plant adaptation checklist and a soil moisture meter to identify water-saving adaptations of the plants they find. On Day 3, students use what they have learned about plant adaptations to design a new plant that has water-saving adaptations that will allow it to survive in a hot and dry environment. On Day 4, students use Flipgrid to film a short video to share the design of their plant with their classmates.

### Learning Outcomes and Assessments

<i>By the end of this module, students will be able to...</i>	<i>You can assess this using...</i>
<b>1. List</b> what plants need to survive and the factors that affect a plant's growth.	Reporter notebooks on Day 1
<b>2. Identify</b> water-saving plant adaptations.	Plant adaptation worksheet on Day 2
<b>3. Explain</b> how at least two water-saving plant adaptations help plants survive in a hot and dry environment.	Class discussion on Day 2, Reporter notebooks on Day 3, and Flipgrid video on Day 4
<b>4. Design</b> a plant that has at least one water-saving adaptation to help it survive in a hot and dry environment.	Reporter notebooks on Day 3 and Flipgrid videos on Day 4

## Weekly Sequence

Section	Description	Length	Format
Day 1	<p><b><i>Plant Adaptations: What Do Plants Need to Survive?</i></b></p> <p>Students are introduced to what plants need to survive as they brainstorm ideas about what affects their growth. Students also draw a picture of a plant to indicate the key needs and factors that affect its growth.</p>	25-30 minutes	Classroom
Day 2	<p><b><i>Plant Adaptations: Water-Saving Adaptations</i></b></p> <p>Students use a plant adaptation checklist to help them identify water-saving adaptations of three plants on their school grounds. They use a soil moisture meter to measure the soil moisture near each plant. They record their data on a worksheet.</p>	25-30 minutes	School grounds
Day 3	<p><b><i>Plant Adaptations: Design a Plant</i></b></p> <p>Students use what they learned about water-saving adaptations to design a plant that can survive in the hot and dry environment at Crystal Cove State Park.</p>	25-30 minutes	Classroom
Day 4	<p><b><i>Plant Adaptations: Sharing Your Plants</i></b></p> <p>Students use Flipgrid to create a short video to share their design for a plant with their classmates.</p>	25-30 minutes	Classroom

## *Big Science Idea*

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Plants need certain things in order to grow and thrive: water, sunlight, nutrients, air, and space to grow. They have specialized parts that allow them to gather the water, sunlight, nutrients, and air so they can photosynthesize and grow. Leaves allow them to gather sunlight and carbon dioxide. Roots allow them to take in water and nutrients from the soil. Stems allow them to transport water and nutrients to the rest of the plant. Flowers and seeds allow plants to reproduce.

While all plants have similar needs, they can't all live in the same habitat. Each species of plant has certain environmental conditions in which it can survive. If the environmental conditions are outside of the plant's range (e.g., it gets too hot), that plant won't be able to survive there. There are a wide range of environmental conditions across the planet. Some places get very hot in the summer and very cold in the winter. Some places have a lot of rain each year and some places get almost no rain all year. Some places have milder conditions and don't experience extreme changes in temperatures throughout the year. In order for plants to survive in the area where they live, they have special adaptations that help them deal with the environmental conditions they experience.

Adaptations include a plant's size; its root system; and the color, size, and shape of its leaves just to name a few types of adaptations. For this activity, students will focus on adaptations plants use to survive in a coastal sage scrub habitat in Southern California, which is a hot and dry environment. Since it is a hot and dry environment, plants that live in this area have water-saving adaptations to help them survive. The leaves of the plants that can survive in this habitat have special adaptations. Examples include waxy leaves, light colored leaves, small narrow leaves, small hairs on leaves, and taco-shaped leaves.

### *If you want to learn more...*

- [\*Coastal Sage Scrub Habitat\*](#)
- [\*Video from California State Parks: Coastal Sage Scrub Adaptations at San Clemente State Beach\*](#)

### *If you want to share more with students...*

- [\*Animated Video: The Needs of a Plant\*](#)
- [\*Plant Adaptations\*](#)
- [\*Animated Video from Scholastic: Plant Adaptations\*](#)

Day 1

**What Do Plants Need to Survive?**  
(25-30 minutes)

Each teacher will need...	Each student will need...
<input type="checkbox"/> <b>Day 1 Slideshow</b> <input type="checkbox"/> Computer, projector, and speakers	<input type="checkbox"/> Reporter notebooks <input type="checkbox"/> Pencil

**Before you start teaching...**

- Open the day's slideshow and check to make sure that the videos play with sound.

**Instructional Learning Sequence**

1. Open the slideshow and play the video on **Slide 2** for the class. Kaitlin will introduce the breaking news story for the week: Erick needs help figuring out which plants are best adapted to survive in the hot and dry environment at Crystal Cove State Park.

After watching the video, recap the story with students: What is the situation with Erick? What do we need to do to help?

2. Advance to **Slide 3** and play the video, where Kaitlin introduces the first task for the students: create a list of what a plant at Crystal Cove needs to survive and what factors affect its growth.

3. On **Slide 4**, students will write their ideas in their reporter notebooks and answer the questions that were introduced in the video:

- What does a plant need to survive at Crystal Cove?
- What might affect the plant's growth at Crystal Cove?

You can have students work individually and share their ideas with the class, work in small groups, or build the lists as a whole-class activity.

Some ideas that may be on the list include:

- Water
- Sunlight
- Nutrients
- Space to grow
- Air
- Amount of rainfall
- Daytime and nighttime temperatures
- Amount of sunlight

4. Move on to [Slide 5](#) and play the video that shows Kaitlin directing the students to refine their lists by selecting the four or five items from each list that are most important for plants.

5. Move on to [Slide 6](#), which provides written instructions on how students should refine their lists. Give students time to work individually or in their small groups to select the four or five most important items on the lists and put stars next to them. If you made the lists as a class, facilitate a discussion to help the students discuss and decide which four or five items should be starred on the class lists.

6. Move on to [Slide 7](#) and play the video where Kaitlin explains that the students will now create a model by drawing a picture of a plant in their notebook and labeling it with the starred items from each list.

7. Move on to [Slide 8](#), which shows the written instructions for creating the model:

- Draw a picture of a plant in your reporter notebook.
- Look back at the list you made. One by one, add each of the starred items to your picture. Make sure to label it and show how it affects the plant.

Give students time to draw their models and walk around the room to check on progress and answer any questions.

8. Move on to [Slide 9](#), which shows the questions students will answer when they share their model:

- What do you think a plant might need to survive at Crystal Cove?
- What do you think might affect a plant's growth at Crystal Cove?
- What are the most important ideas to share with Erick?

There are several ways you can facilitate the sharing of their models. You could have a whole-class discussion, you could have them share within small groups, or you could have them share with a partner.

Day 2

**Water-Saving Adaptations**  
(25-30 minutes)

Each teacher will need...	Each student will need...
<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Day 2 Slideshow</b></li> <li><input type="checkbox"/> Computer, projector, and speakers</li> <li><input type="checkbox"/> (2) Soil moisture meters</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Reporter notebooks</li> <li><input type="checkbox"/> Pencil</li> <li><input type="checkbox"/> <b>Plant Adaptation Checklist and Worksheet</b></li> <li><input type="checkbox"/> Clipboard (optional)</li> </ul>

**Before you start teaching...**

- Open the day's slideshow and check to make sure that the videos play with sound.
- Make copies of the plant adaptation checklist and worksheet. Gather clipboards if you want students to use them with the checklist and worksheet.
- Gather the soil moisture meters

**Instructional Learning Sequence**

1. Open the slideshow and play the video on **Slide 2**. Kaitlin will talk with Erick who shares an update on the project. Erick has decided that water-saving adaptations are the best adaptations for plants in Southern California and they need help determining which strategy is the best. They tell the students that they will use a plant adaptation checklist to identify adaptations of plants around their school and use a soil moisture meter to measure the soil moisture near plants to determine if adaptations are working.

2. Move on to **Slide 3** and play the video so students can learn how they will explore their school grounds to learn about plant adaptations. They will use the checklist to identify adaptations on three plants and record their observations on their worksheet. They will also use a soil moisture meter to measure soil moisture by pressing the silver rod into the ground next to each plant and record the measurements on their worksheet.

3. On **Slide 4**, which shows the written instructions for what students will do during their exploration:

- **First**, describe or draw each plant.
- **Then**, circle the water-saving adaptations they have! They could have none, one, or many, so circle or write in any adaptations you notice.
- **Lastly**, use the soil moisture reader to see how much water is in their soil. This data could help you determine which water-saving adaptation is the best!
- **Repeat** for three plants total!

Before going outside with the students, give them the plant adaptation checklist and worksheet. If available, give each student a clipboard to hold the papers. Review the material with the students to ensure they understand what they will do once they are out of the classroom. Provide the necessary directions for safety and logistics for how they will walk around the school grounds. For example, you may want to make sure they know that they should walk at all times and should always be within eyesight of you and any other adults who may be accompanying them. Give explicit directions for boundaries so they know which areas of the school grounds they are allowed to explore. Let them know if you want them to work individually, in pairs, in small groups, or if you will do the activity as a class and all visit the same plants at the same time.

4. Once all instructions are given, head out onto the school grounds and assist students as necessary as they observe plants. Put the soil moisture meter into the soil next to the plants they are observing to get a reading. They can record the reading on their checklists. Make sure to give them updates on how much time is remaining as they go through the activity so that they can allocate their time accordingly in order to observe three plants. When time is up, gather all of the students together and return to the classroom.

5. Once you return to the classroom, move to **Slide 5**, which shows a few discussion questions:

- What plants did you observe?
- What water conservation strategies did you notice them using?
- What water-saving adaptations do you think would be most effective for a plant growing in a hot, dry area like Crystal Cove State Park?

Facilitate a discussion with the students so they can share their observations of the plants and discuss their ideas for the best water-saving adaptations for plants at Crystal Cove State Park.

Day 3

**Design a Plant!**  
(25-30 minutes)

Each teacher will need...	Each student will need...
<ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Day 3 Slideshow</b></li> <li><input type="checkbox"/> Computer, projector, and speakers</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Reporter notebooks</li> <li><input type="checkbox"/> Pencil</li> <li><input type="checkbox"/> Colored pencils (optional)</li> </ul>

**Before you start teaching...**

- Open the day's slideshow and check to make sure that the videos play with sound.
- Gather colored pencils if you want students to use them as they design their plant.

**Instructional Learning Sequence**

1. Open the slideshow and play the video on **Slide 2**. Kaitlin and Erick will ask students to take what they have learned about plant adaptations and design a plant that has the right adaptations to survive at Crystal Cove State Park.

2. Move to **Slide 3**, and facilitate a discussion so students can review what they have learned and share their ideas about the following questions.

- What adaptations did you observe?
- Which water-saving adaptations seemed to help the plant the most? Why?
- Which adaptations might you include in a new plant intended for a hot, dry place like Crystal Cove State Park?

3. Advance to **Slide 4** and play the video where Kaitlin provides the details about how students will design their plant. They should include at least one water-saving adaptation in their design and should label the parts of the plant.



4. Advance to *Slide 5*, which shows the written instructions on what to include in their drawings in their notebook:

- Think about how the plant will get the resources that it needs to survive.
- Include at least one water-saving adaptation.
- Label parts of the plant (roots, stem, leaves, flowers, etc.).

Make sure all students understand what they should do and then give them time to create their design. Walk around the room to check on progress and answer any questions.

5. Once all students have completed their plant design, move to *Slide 6*. Facilitate a class discussion to allow students to share their design by answering the following questions.

- What does your plant look like?
- How is it adapted to save or conserve water?
- How else is it adapted to survive at Crystal Cove State Park?

There are several ways to do this. You could have each student share with the entire class, you could have them share within small groups or with a partner, or you could arrange for a gallery walk where half of the students stay with their design to explain it to the other half of the students who walk around to visit each student and then the groups switch and the other half can explain their designs.

Day 4

**Sharing Your Plants**  
(25-30 minutes)

Each teacher will need...	Each student will need...
<input type="checkbox"/> <b>Day 4 Slideshow</b> <input type="checkbox"/> Computer, projector, and speakers <input type="checkbox"/> <b>Plant Adaptations Flipgrid</b>	<input type="checkbox"/> Reporter notebooks <input type="checkbox"/> Pencil <input type="checkbox"/> Tablet with access to the internet

### *Before you start teaching...*

- Open the day's slideshow and check to make sure that the videos play with sound.
- Make sure you have enough computers, tablets, or phones for students to use to create their videos.
- In this session, students will use Flipgrid to create a short video. **Flipgrid** is a free platform that allows students to film and share short videos in response to a prompt. If you haven't used Flipgrid before, spend some time signing up for a free account and becoming familiar with how to use it.

### *Instructional Learning Sequence*

1. When you open the slideshow, advance to **Slide 2** and play the video. Kaitlin and Erick will explain that the students will use an app called Flipgrid to create a short video to share their plant designs.
2. Advance to **Slide 3** which shows shows written instructions for how students will use Flipgrid:
  1. Click on the Flipgrid link (<https://flipgrid.com/d712b4a8>) to join the Flipgrid. Or you can visit Flipgrid's main website (<https://info.flipgrid.com/>) and under "Enter your Join Code" use join code: **d712b4a8**
  2. Once you have joined, you'll see your educator's Topic, or discussion prompt. Follow the instructions and when you're ready to record, click the red Record a Response button or the Flipgrid logo for the camera to start.
  3. When you're in the Flipgrid camera, you can record a video in these 3 easy steps:
    - A. **Tap Record:** Tap the record button on the bottom to start. Add fun stickers, filters, text, and more. Tap the arrow on the bottom right to advance.
    - B. **Review Your Video:** Trim, split, rearrange, or add more. Tap the arrow in the bottom right to advance.
    - C. **Submit Your Video!:** Edit your cover image, name, add a title, or attach a link. Then submit!

Review the steps with the students and ask if they have any questions about how to use Flipgrid.

**3.** Give students time to work on their videos. Walk around the room to check on progress and answer any questions. Students may need to spread out to other spaces so that they can make their videos without interference from other students making their videos. If they need to leave the room to do this, make sure they have adult supervision and understand the boundaries for where they can and cannot go.

**4.** Once all students have finished making their videos, move to *Slide 4*, which provides instructions for how they will share their videos.

- On Flipgrid, go and watch your classmates' videos to see the video they created and what plant adaptation they picked!

Allow students to watch their classmates' videos. Once they have viewed all of the videos, facilitate a class discussion so students can share their thoughts about all of the different designs and how they incorporated water-saving plant adaptations.

**5.** Move to *Slide 5* and play the video so that Kaitlin can thank the students for their help throughout the week.