

Session 5: Collecting Data in the Garden

Focus: Creating a System Model

Grade Level: 3-5

Session Length: 40-60 minutes

Driving Questions

- How can we collect data to determine which plant type attracted the most birds?

NGSS Links

- Planning and Carrying Out Investigations

Systems Thinking Characteristics

- Identifying Hidden Dimensions of the System

In the fifth session of Project Crystal, students go back to the caterpillars they placed in the garden in the previous session, and record data in their science journals to record their results. They then go back to the garden and count how many of the caterpillars they placed on each plant have visible signs of being attacked by birds.

Students will be introduced to the types of data they will need to record in the garden, and set up a simple data sheet in their science journals to record their results. They then go back to the garden and count how many of the caterpillars they placed on each plant type have visible signs of being attacked by birds.

Learning Outcomes & Assessments

<i>By the end of this module, students will be able to...</i>	<i>You can assess this using...</i>
1. Describe the process of collecting scientific data to answer their research question.	Science journal entry; Research team discussions
2. Follow protocols to record data on the number of bird attack marks and plant characteristics.	Science journal entry; Research team discussions

Session Overview

Section	Description	Length	Format
Launch	Students watch a video of Kaitlin, who introduces the task for Session 5: they will go back to the clay caterpillars they placed in the garden and record how many of them were attacked by birds.	5 minutes	Whole group
Explore	Students set up a data sheet in their science journals, then find the caterpillars they placed on each of the two plant species and record how many of the caterpillars on each plant type have marks that indicate that a bird tried to eat them. They can also record any additional observations.	25-30 minutes	Research teams
Share	Student research teams share what they observed in the garden with the other teams.	5-10 minutes	Whole group
Reflect	Students reflect on their experience collecting data.	5 minutes	Individual

Materials

- *Session 5 Google Slides Presentation*
- Science Journals and pencils (1 per student)

Before You Start Teaching

- Copy over the Session 5 Slideshow to your own Google Drive account. Test to make sure that the videos work. (If not, you may have to check the permissions on the Crystal Cove Conservancy Youtube Account.)

Learning Sequence

Launch

Getting Ready to Collect Data! (5 minutes)

1. Open the [Session 5 Slideshow](#) and play the video on [Slide 2](#) for your group. In this video, Kaitlin will introduce the next step in the process that students will take part in during Session 5.
2. After watching the video, move on to [Slide 3](#), which gives an overview of what students will do and learn during Session 5.

Explore

Collecting Data (25-35 minutes)

1. Advance to [Slide 4](#) and play the video. Kaitlin will give the research teams an overview of what types of data they will help to collect to answer our research question. Then, advance to Slide 5 that lists the 5 different types of data that students will need to record: (1) plant species, (2) plant trait, (3) total number of caterpillars on that species, (4) number of caterpillars with attack marks, (5) other observations.
2. Then, advance to [Slide 6](#) where Kaitlin demonstrates how to set up a simple data sheet in their science journals. Have students open up their journals to a blank page and follow along with Kaitlin to set up their data sheets.
3. Once they have set up one data sheet following along with Kaitlin, move on to [Slide 7](#) and have them create the same simple table again so they can record the same data for both types of plants they are comparing. Depending on how much space they used for the first table, this could be on the same page or the next page after.

An example data sheet is shown below:

Plant Species	Buckwheat
Plant Trait	Small leaves
Total Number of Caterpillars	10
Number of Attacked Caterpillars	2
Other Observations	One caterpillar fell off! Some signs of leaves being eaten

4. Next, advance to *Slide 8*, where Kaitlin will introduce the student's task for the day. They will find all the caterpillars they placed on their two chosen plant species, and fill in their data sheet to record how many of them were attacked by birds.

5. Bring the students back out to the garden where they originally set up their experiment, and ask the teams to find the caterpillars that their group placed out, and fill in their data sheet for each plant type. Remind them to find all 7-10 caterpillars they placed out on each plant, and count how many have attack marks.

Have the students start with the caterpillars on one plant species, and move onto the next plant only after they have recorded all the data for the first plant species.

Sharing Our Observations (5-10 minutes)

Share

1. Once the research teams have each finished recording data on the caterpillar attack marks and their other observations, bring all the groups together to share any initial observations. Open the slideshow to *Slide 9* and ask the teams the following questions about what they observed:

- Did any of your caterpillars look like they had been attacked by birds? How could you tell?
- Did your team notice any trends in the caterpillars with attack marks? Were they attacked more on one plant type over another?

Some groups may have noticed different trends than others, and that's ok! This helps us understand why it's so important to collect lots of data, or use replication.

Ask the students if they can think of other factors besides the type of plant that could affect where the birds ate the most caterpillars. For example, are any of the plants more out in the open than others? Closer to trees? Did some caterpillars fall off of any of your plants?



Reflect

Reflecting on Session 5 (5 minutes)

1. Finally, bring the students back inside to wrap up for the day. Play the video of Kaitlin on *Slide 10*, and then advance to *Slide 11* with reflection questions. Give each student a few minutes to answer the questions in their notebooks.
2. Finally, thank the group for their work today! Tell the group that the next step will be to take a closer look at the data to look for patterns to answer our research question!