

Making hypotheses and building models about cause-and-effect relationships in nature

Lesson Synopsis

In this lesson, students solve a real nature mystery filmed at the Rogue River Preserve. After watching a video that shows the scene and its surroundings, students work collaboratively and individually in Google Slides to articulate their observations, build their hypotheses, and develop a consensus model about what happened to create the scene shown in the video.

Learning Outcomes

During this lessons, students will:

- make and organize observations based on content in a video
- hypothesize about cause-and-effect relationships between organisms (beyond basic predator-prey relationships)
- collaborate with peers to develop a consensus model

NGSS Alignment

Disciplinary Core Ideas: LS2.A: Interdependent Relationships in Ecosystems

Crosscutting Concepts: Cause and Effect

Science and Engineering Practices: Developing Models; Constructing Explanations

Linked & Embedded Resources

When using resources from the Google Drive, please duplicate each resource and then move it to your own Drive to ensure that the original remains intact for other users.

- Google Earth Project: Rogue River Preserve Interactive Map for Grades 3-5 available [here](#)
- Video: Nature Mystery (embedded in the map or available on YouTube [here](#))
- Google Slides: Solving A Mystery (master copy available in the Google Drive [here](#))
- Google Slides: Consensus Models (directions for creating this resource are below)

Approximate Time Needed

30-60 minutes

Digital Tools

Google Earth

Google Slides

Synchronous discussion platform with breakout/small group rooms available

Student Activities

To begin, let your students know that in this activity, they'll be solving a nature mystery that turned up at the Rogue River Preserve. Explain that they will watch a video and then come back together to figure out what happened to make the mysterious scene. Remind them to keep their eyes and ears open for clues when watching the video! You may even want to ask them to take some notes while they watch.

To start the activity, ask students to navigate to the Nature Mystery on the Interactive Map. To do so, use the “Table of Contents” navigation drop-down menu in the lower left corner of the screen, or look for the purple pin with a star on the map itself. The text box at the location prompts students to watch the embedded video. Alternatively, you can share the YouTube link with your students, or you can stream the video yourself and watch as a group. However, these options take the mystery out of its surrounding context at the Preserve.

The text box on the map prompts students to follow the link provided by their instructor after they’ve watched the video. Share with them the link to the “Solving A Mystery” Google Slide that you copied onto your own Drive.

Once your students have pulled up the Solving A Mystery slide, invite them to begin recording any observations that they made while watching the video. Ask that each observation be put in its own text box so that you can move them around individually, and encourage students to resize each text box and give it a background color so it’s easier to see all of them. As they’re recording their observations, direct students to move their text boxes into clusters in the four quadrants of the slide, based on what their observation is mostly about (plants, animals, surroundings, other).

After students have had a few moments to make their contributions and roughly cluster them by topic, ask the group to make an initial assessment about the information that they’ve collected. Ask them: What patterns do you notice? Was there anything that only one person noticed? Was there something that everyone saw?

Next, remove duplicate ideas so each observation is only represented once. You can do this yourself or ask for help from students, but be careful of overenthusiastic deleting – it’s important to keep one copy of each observation on the slide.

Explain to students that now, they’ll have an opportunity to come up with a best guess of what happened, based on this collection of observations from the whole group. Direct all students to duplicate the slide (right click the topmost slide in the right hand column and select “Duplicate slide”), and then replace “Other” with their own name.

On their own new slide, ask students to move the key observation boxes around to create a diagram that explains what they think happened to make the scene in the video. Direct them to add lines, shapes, labels, and additional text boxes to explain the relationship between the different observations. Remind students that they’re just taking a guess, and it’s alright if it’s not correct. Also remind them that every clue might not be part of the solution! For students who prefer to work on paper, they can go through a similar process and then take a picture of their model and add it to their slide by going to Insert > Image > Camera and then holding their work up to the camera. Allow the students 5-10 minutes to complete their models.

Once students have had a chance to make some guesses about the mystery scene, break them up into small groups of 3-5 students using breakout rooms. In their small groups, direct students to take turns explaining their diagrams, with all group members navigating to each model as the owner explains it. Ahead of time or while students are working, create a new Google Slide deck with one blank slide for each small group. This is where students will share their consensus models.

Ask each small group to compare and contrast their group members' models and work together to create a new model that incorporates ideas and contributions from everyone. This consensus model can be created digitally in the new slide deck, or by a single student on paper, but should reflect input from all of the members of the small group. If working on paper, make sure all group members have a chance to see and reflect on the diagram using the Insert > Image > Camera process described above.

Finally, bring the whole class back together. Invite students to browse all of the groups' consensus models by navigating through the slide deck. Ask the students: What similarities do you see between the models? What differences? Do any models stand out, and why? Which of these models do you think represents what really happened at the Preserve? Why do you think it's valuable to compare our ideas like this?

Asynchronous Adaptation

Direct students to the Nature Mystery point on the Interactive Map. Let them know that the instructions for the activity will appear when they click on the pin or location name. The instructions say:

Can you solve this nature mystery? First, watch the video above. Then, follow the link provided by your teacher to work with your classmates figuring out just what happened here.

If your teacher doesn't provide a link, follow these steps:

- 1) Write down all observations that you make while watching the video. No observation is too small!
- 2) For each observation that you wrote down, decide whether it's about plants, animals, the surroundings, or something else. Which did you notice most about?
- 3) On a fresh sheet of paper, draw a diagram that shows how the plants, animals, surroundings, and other things might have interacted to create the scene shown in the video.
- 4) Share your diagram with your teacher using the method they request.

Optionally, students may look at each other's models and compare their hypotheses about what happened to create the scene in the video.