

Sandia Mountain Natural History Center

Ecology Field Program

Lichen Key Lesson Plan

Your Name:	
Grade Level: 5th	Subject Area: Life Science
Lesson Title: Lichen Key	Lesson Length: 20-25 minutes

The Teaching Process

Lesson Overview

Students search different areas to identify different species of lichen. Students will count the number of lichen species to determine the air quality of the survey area.

Lesson Objectives:

1. Students will learn or recall what lichen is
2. Students will utilize evidence to determine if the area had poor, average, or excellent air quality.
3. Students will learn about symbiotic relationships.

Standards addressed

NMSS: NM I- Scientific Thinking & Practice, BM I- Scientific Method 1; Scientific Thinking & Practice, BM III- Measurement & Data 3;

NM II- Life Science, BM I- Ecosystems 1

NGSS disciplinary core ideas: LS 2.A, LS 2.B

NGSS crosscutting concepts: Cause & Effect; Systems & System Models; Energy & Matter

NGSS science & engineering principles: Engaging in Argument From Evidence

CCSS: RI 5.4, RF 5.3, L 5.1, L 5.2, L 5.4, SL 5.1, W 5.10

List of Materials

Lichen key, notebook, pencils. Optional: magnifiers.

Instructional Sequence

Phase One: Engage the Learner

Through questioning, the instructor focuses students on the terrain and trees of the area, leading into noticing the lichen. Explain to the students that lichen is not one, but two organisms and that they have a symbiotic relationship. The fungus gives the algae a home and the algae feeds the fungus. Students may spread out and turn in place to make a 360° observation. Students describe what they see and may compare/contrast it to a previous stop. Important observations to be discussed are the colors and where the lichen may be growing; trees or rocks, wild landscape or city. Part of the discussion focuses on what a symbiotic relationship is, what a bio indicator is, and how the air smells.

What's the teacher doing?

- Guides students through questioning and simple observation to understand what is happening in the area.
- Prompts students to explain what a symbiotic relationship and a bio indicator is.
- Assesses students' grasp a symbiotic relationship and bio indicators.
- Models how & where to look for lichen.
- Prompts students to consider how lichen may be important in an ecosystem.

What are the students doing?

- Observe their surroundings
- Use prior and/or recently gained knowledge to actively participate in discussion.
- Prepare for the activity by distinguishing between different species of lichen.

Phases Two-Four: Explore the Concept; Explain the concept and define terms; Elaborate the Concept

During this portion of the activity students explore the area looking for different species of lichen while using a guide to help them identify the different species. With their partners, students will need to confer to arrive at a consensus. Students will then draw the different species making note of the differences. Optional: Have them create a way to remember the relationship between the algae and fungi that form lichen. Example: Alice Algae took a "lichen" to Freddy Fungus and now their relationship is on the rocks.

What's the teacher doing?

- Explains directions and describes boundaries for activity.
- Actively monitors students by checking for understanding, guiding students and discussing finds.
- Encourages students to closely explore the lichen and immediate area around it.

What are the students doing?

- As partners and with *Lichen Key*, students explore the area and classify the different species.
- With close observation, students draw lichen and make notes about differences.
- Students create a means of memorizing the relationship between algae and fungi that form lichen.
- Students use the scale on *Lichen Key* to determine the air quality.

Phase Five: Evaluate students' Understanding of Concept

While sharing with the group, students may reference the guide, but must provide evidence to support their claim as well as use their observations to determine which lichen they identified and where it was located.

What's the teacher doing?

- Gathers students back to meeting area.
- Leads students in sharing their finds and citing evidence.
- Assesses student understanding of lichens' role in the ecosystem through questioning and discussion.

What are the students doing?

- As a group, students share some of different types of lichen they have found. Students must back up their claim with evidence.
- Students share their drawings.
- Students share their poem or other device for remembering the relationship between algae and fungi that form lichen.

