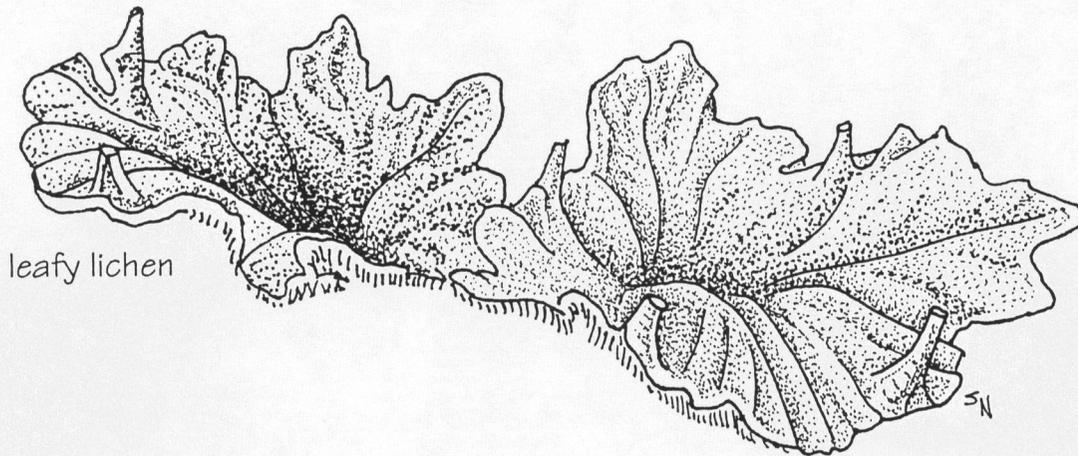


LICHENS, WE LOVE 'EM!



leafy lichen

KEY QUESTION

What kinds of places do lichens prefer most?

CURRICULUM FRAMEWORK TOPICS:

II.A.7. Complex Interactions Between Organisms

RELEVANT HANDBOOK ENTRIES:

None

TARGET AUDIENCE: GRADES 3-5, AGES 8-10

Suitable for visual learners. Appropriate for all academic ability levels.

SCIENCE PROCESS SKILLS USED:

BASIC: Observation, Classification, Inference

CORRELATED STATE PERFORMANCE

OBJECTIVES:

Primary Minimum Standards:

7 18 102

Primary Standards of Excellence:

1027 1031 1044 1047 1176 1486

Elementary Minimum Standards:

2 3 20 23 27 29 36 61 64 65 105

Elementary Standards of Excellence:

1031 1041 1044 1047 1052 1486

TIME REQUIRED TO COMPLETE LESSON:

In-class: 30-40 minutes. In-field: 25-30 minutes.

BEST TIME OF YEAR FOR LESSON:

All year

BEHAVIORAL OBJECTIVES

As part of this activity, students will:

- (C) 1. observe and describe different types of lichens.
- (C) 2. identify and classify the environmental conditions that foster the growth of lichens.
- (A) 3. become aware that different organisms have different requirements for survival.
- (A) 4. describe the impact of human disturbance of habitats on lichen growth.

MATERIALS

ESSENTIAL:

- "Lichens, We Love 'Em!" worksheet (one per group of two-three students)
- Clipboards or other hard writing surface (one per group of two-three students)
- Samples of typical foliose, crustose, and fruticose lichens

GETTING READY

Designate boundaries for the lichen hunt and locate and collect samples of common lichens:

foliose (leafy); crustose (embedded or crusty), and fruticose (shrubby). Try to include areas near the street or parking lot as well as more secluded areas in the study site.

PROCEDURE

BEFORE GOING OUTSIDE (15–20 MINUTES):

Pass around samples of the three different types of lichens and ask students to describe the differences between each type. You might want to describe some of the uses of lichens (e.g., dyes and drugs). Briefly explain that a lichen is really a combination of two different kinds of organisms living together. Explain that lichens are composed of both fungi and algae and that both types of organisms benefit from the presence of the other. This type of relationship is called mutualism. Make sure students understand that lichens are not parasites. They do not harm the plants they grow on.

WHILE OUTSIDE (25–30 MINUTES):

Explain that during this activity, students will be going on a lichen hunt. Divide students into groups of two to three and distribute a "Lichens, We Love 'Em!" worksheet and a clipboard to each group. Review the worksheet with students and point out the boundaries for the activity. Encourage students to find as many different kinds of lichens as they can and remind students **not** to collect or disturb the lichens. Their "lichen hunt" is just for collecting data, not specimens.

AFTER GOING OUTSIDE (15–20 MINUTES):

1. Have each group briefly share its results with the rest of the class. Encourage students to refer to their worksheets and conduct a whole-class discussion addressing the following questions:

- What kinds of surfaces do lichens grow on?
- Do they seem to grow more on living or non-living surfaces?
- Do lichens seem to grow more in sunlight or shade?
- Do lichens seem to grow more near the ground or away from the ground?
- Do lichens seem to grow more in moist areas or dry areas?

- How many different colors of lichens can be found in our study site?
- What is the most common type (crusty, leafy, shrubby) of lichen in our study site?
- Is there a difference in the amount of lichens found near the road or parking lot and the amount of lichens found in more secluded areas? Why?

Make sure students understand that lichens can grow in a variety of different environmental conditions and on a wide variety of living and non-living surfaces. They are most commonly found growing on rocks or wood. Many lichens are found in shady, moist areas, but most prefer lots of sunlight and moderate amounts of moisture. Although lichens can withstand a variety of extreme environmental conditions, leafy and shrubby lichens are very sensitive to pollution, especially sulfur dioxide from car exhaust and smoke. Hence the number of lichens near a street is usually less than the number of lichens in less polluted areas.

2. Ask students what impact human-generated pollution has on lichen growth. Finally, ask students how lichens might be useful as indicators of air quality.

GOING FURTHER

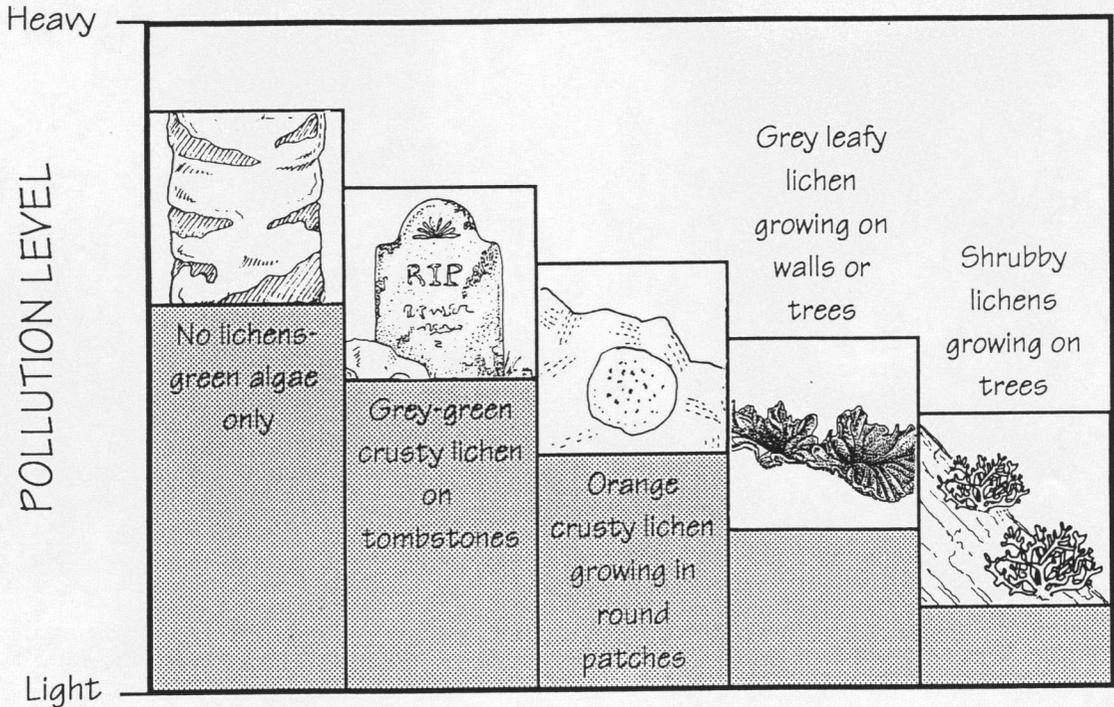
1. Distribute a "Lichen Scale" to each student and have students use the scale to estimate the level of air pollution in different areas of the schoolyard or community.

2. To compare the characteristics of lichens and mosses (another group of organisms commonly found growing on trees), complete the activity "Mosses Are Picky Devils."

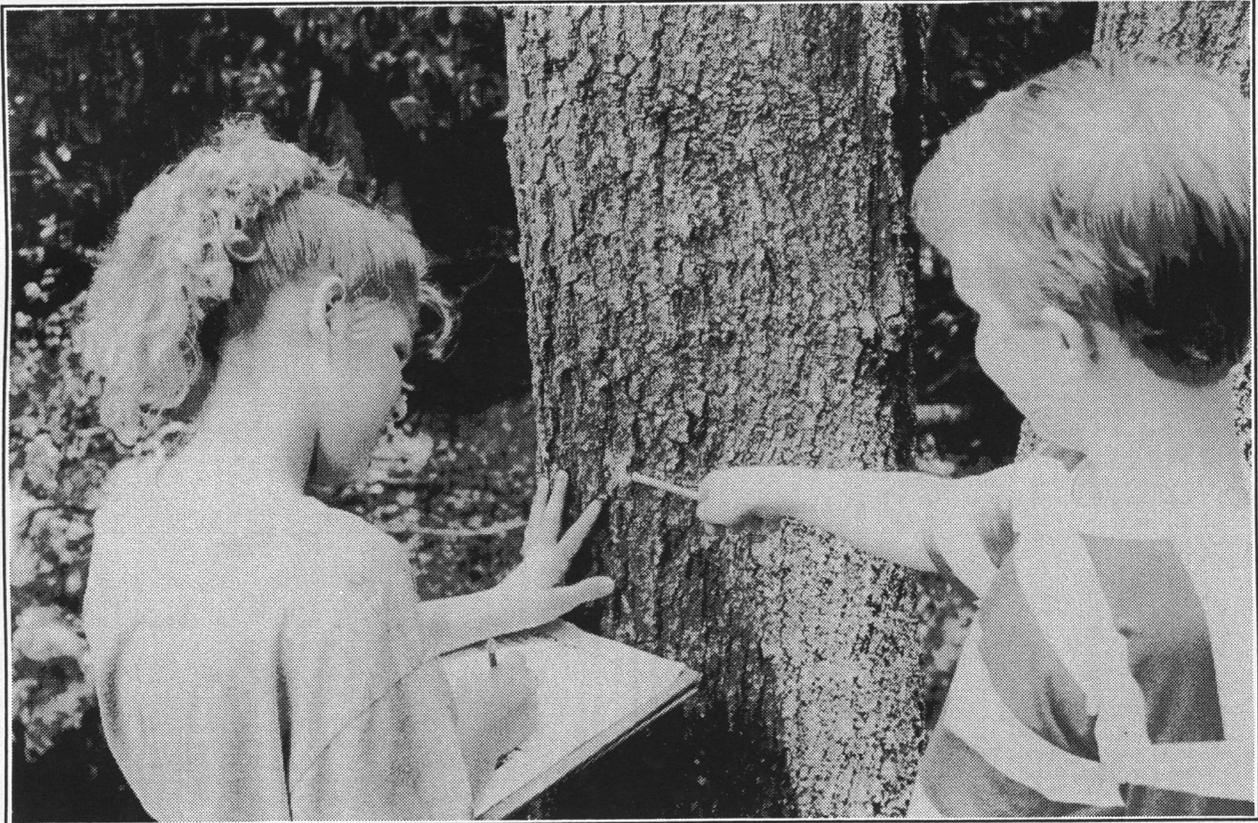


crusty lichen

LICHEN SCALE



TYPE OF LICHEN



Looking at lichens