Likable Lichens

“Alana the Algae (or Caterina the Cyanobacteria) and Frank the Fungus took a lichen to each other”

Objective
The student will be able to:
1) Describe lichens and symbiosis
2) Identify lichen types in the field
3) Collect, record and assess data

Materials provided
- Lichen type cards (20)
- Lichen specimens (8)
- Datasheet master copy
- Common Lichens of the Rogue Valley Powerpoint (CD or via SEEC website)

Introductory Activity
a. Set out lichen specimens for students to look at. Ask students what they think they might be and compile a list of ideas on the board.
b. Explain that students are looking at lichens-a composite organism created by a fungus and a photosynthetic partner-green algae or cyanobacteria (sometimes both!).
c. Explain that the relationship between the fungus, algae and/or cyanobacteria is an example of symbiosis (a long-term, close relationship between two different organisms). Guide students to come up with other examples of symbiotic relationships (pollinators/flowers, anemone/clown fish).
d. Discuss the role of each symbiotic partner-generally the fungus provides a home for itself and the algae or cyanobacteria, who in turn provides the food through photosynthesis.
e. Explain that lichens are all around us and come in many different growth forms-crustose (crusty), fruticose (shrubby), and foliose (leafy). Use lichen specimens as examples and/or photos from the PowerPoint (Common Lichens of the Rogue Valley). Have students try to identify which lichens might be which growth type as you go through photos or pass around lichen specimens.
f. As a lead into the Field Survey, ask students where they might find lichens. Where do you think we would find lichens? What do you think they grow on? Do different lichens grow on different things (substrates)?

Appropriate Grade Level: 4-6th
Time Required: 1+ hours
Curriculum Standards:
Core Standards: Structure and Function 4.1, 5.1
Science Inquiry Standards: 4.3S.1, 4.3S.2, 5.3S.1, 6.3S.1, 6.3S.2
Life Science Standards: 5.1L.1, 5.2L.1
Field Survey: Lichen Growth Types Survey

Students survey a site for lichens to identify lichen growth types and determine type abundance.

**Location:** school yard or nearby park

**Materials:** lichen type cards, lichen datasheets (Option A), pencils and colored pencils

**Procedure:**

1. **Survey Teams:** Split students into survey teams. Each team will survey a different area of the site.

2. **Forming a Hypothesis:** Before students begin to look for lichens, students will guess what types of lichens they think they might find in their study site and record their hypothesis (guess) on their datasheet (ex. I think I will find many crustose lichens).

3. **Collecting and Recording Data:** Students will locate lichens and record data on datasheets. Students will record the substrate the lichen grows on (tree bark, rock, pavement), and try to identify the lichen growth type based on the lichen type cards. Students can also discuss how to collect and record data (make observations, write clear, legible notes etc).

4. **Scientific Sketches:** Once students have finished gathering data, students will re-find a favorite lichen they found during the survey. Students will individually create a scientific sketch of their favorite lichen including interesting characteristics such as color, size, presence of other organisms on the lichen, wet or dryness etc. If time allows, have students share the lichen they chose within their teams or with a partner.

5. **Graphing Data:** When students return to the classroom use their data to create a class bar graph on the board explaining what they found (see Figure 1). Discuss how to read a graph and what kind of information you might be able to determine by looking at one.

6. **Discussion:** Were certain lichen types more abundant than others? Did your study site have more of one kind of substrate (all rock, all trees etc)? Did certain lichen growth types grow on certain kinds of substrates? How does your data relate to your original guess/hypothesis?

7. **Explore:** Encourage students to keep an eye out for lichens around their neighborhoods. Once you start observing lichens, they’re everywhere!

![Figure 1. Example of a lichen types graph for a class.](image)

**Likable Lichens**
**Sources**
Siskiyou Environmental Education Center. Likable Lichens-previous version.

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<table>
<thead>
<tr>
<th><strong>Lichen Type Card</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruticose</strong></td>
</tr>
<tr>
<td><img src="image1" alt="Fruticose Lichen" /></td>
</tr>
<tr>
<td>Branched shrub-like lichens attached to the twig by a sucker-like holdfast.</td>
</tr>
<tr>
<td><strong>Foliose</strong></td>
</tr>
<tr>
<td><img src="image2" alt="Foliose Lichen" /></td>
</tr>
<tr>
<td>Leaf-like lichens attached to the twig by the lower surface.</td>
</tr>
<tr>
<td><strong>Crustose</strong></td>
</tr>
<tr>
<td><img src="image3" alt="Crustose Lichen" /></td>
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<tr>
<td>Crust-like lichens which are only removed by cutting the bark.</td>
</tr>
</tbody>
</table>

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