Taking a Liking to Lichen!

What do lichens tell us about the air we breath?

Lichen Learning Goals

1. Understand lichen as an indicator species
2. Conduct the scientific method to asses air quality using lichen
3. Present your findings to the community

Skills

1. Observation
2. Data collection
3. Presentation
4. Much more!!

Schedule

Day 1:	Task 1
Day 2:	Task 2
	Task 3
Day 3 & 4:	Challenge Board
Day 5 :	Presentation
Day 6:	Challenge Board Follow up

What is lichen?

Lichen is composed of not one, but two organisms: a fungus and an alga. The two organisms have formed a harmonious relationship, with the alga providing energy through photosynthesis and the fungus providing shelter and protection. Lichens do not extract nutrients from the surfaces on which they grow, but instead absorb nutrients from the atmosphere. While lichens can exist in some of the most extreme, inhospitable environments on the planet (mountain tops, deserts, polar regions, etc.) they are extremely sensitive to air pollution.

This makes lichen a good indicator for assessing air quality, also known as a bio-indicator.

Why do *you* think lichen is sensitive to air pollution?

Task 1:

In groups of two, spend the day *studying lichens around the school*. If the class can find more then ten different types of lichen within the class period then you can proceed to the next challenge…

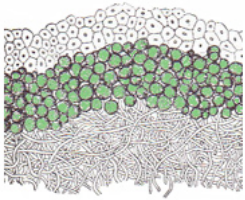
Task 2:

As a class, decide upon 2 different sites within your community where you would like to test air quality. Through a series of field trips, we will visit these sites, including the areas around them, to examine the types of lichen present. Using this information, as well as other class material, we will reveal the severity of air pollution in our community. *Create a way that will best record and detect the affects of pollution*. Work in groups of two.

Task 3:

As scientists, you will need to determine the best way to *present your findings to the community*. It should be meaningful and make people aware of the environmental significance of lichens in their community.

Cross Section of Lichen



Cortex (top)

Algal Layer

Medulla (bottom)

Lichen Challenge Board

Write a letter to the Mayor advocating for stronger legislation on air quality. Explain your experiment and your findings.	Design a study that uses lichen to test for acid rain. Research an area where high levels of acid rain occur and then do it!	Attend a public meeting for a local environmental group. Share your findings in a professional manor.
Interview an expert on lichen and other eco-indicator species in the area and ask them at least 15 thoughtful questions. Report to the class your findings.	Design an eye catching pamphlet on why lichen is an important bio-indicator and distribute 50 copies throughout your community.	Film an informational video on why lichens are important bio-indicators and post it on youtube.
Volunteer to sample two more forested communities for lichen analysis. Study the quantity and species type in order to hypothesize why the two communities are similar or different.	Create an artistic and visually stimulating representation of diverse lichen community and compare it to a community of lichen affected by air pollution.	Create your own bio-monitoring lichen challenge. What are you interests? What would you like to find out?