Lichen Project Final Report
Field Biology

This report is an individual assignment. It should be written in the PAST TENSE (because you will be completing this report after your project is complete). When you are done, e-mail your work to dan.bregar@corvallis.k12.or.us with the subject line "per *X your name* Lichen report".

Introduction:

This section of your report consists of a description of your question and background information about your project. You can use information from your lichen project proposal.

In one paragraph, explain your "What is the Relationship Between" question. Add some supporting details to clarify the purpose of your study.

In another paragraph, describe the factors that you chose and how one might influence the other.

Methods:

This section of your report will contain the step by step list for answering your WITRB question. The first step of instructions is how you will measure the factor that influences lichens and the second will be how you will perform the measurement you have chosen for the lichens

Make sure that your instructions are clear, detailed, and describe the actual steps you took to make your measurements.

Results:

This section of your report will describe the information you found and include data tables (NOT graphs!) that summarize the measurements and calculations you made.

In one paragraph, write about the information you found. Describe the lichen data you collected by using averages and totals. Compare the data you collected on different days (if you were able to collect more than one days' worth of data). Be thoughtful about the comparisons and calculations you make – ensure that your summary makes sense both numerically and ecologically.

Also include in this section at least 2 summary data tables. These tables should compare and contrast the lichen data you collected

Discussion:

In this section of your report, you will use your data to answer your question. This section will include graphs that show the trends in your data along with your interpretation of those graphs and an overall critique of your study.

You will need to have at least two graphs showing your results. Depending on the project that you created, these may be xy scatterplots or some other type of graph that visually represents your data and a possible correlation.

For your written analysis, answer the following questions (in paragraph form) for EACH graph:

1. What was the correlation or possible relationship that your data shows – positive (up and to the right); negative (down and to the right); or none (horizontal line)?

2. What does this correlation tell you about the answer to your question?
3. What other ecological factors do you think might have influenced the correlation (or lack thereof) that you see?

Your response to these questions should be about one paragraph in length for each graph in your report.
(You should have at least two graphs showing a visual representation of your data.)

Here is an example of what your final report should look like:
Lichen Study Final Report – Lichens, Tree Species

Introduction:

The question I asked for my study was " What is the relationship between the types of lichens and pH of the bark that they are attached to?" After walking through the woods this weekend I wondered if certain lichens grew only on certain tree species. Through research I found that certain tree species have higher alkalinity than others. I was curious what kind of effect this had on the types of lichens so I decided to compare three tree species, the Sugar Maple, White Alder and the Garry oak tree.
The *pH* scale measures how acidic or basic a substance is. It ranges from 0 to 14. The closer the measurement is to 0 the more acidic the bark is and the closer it is to 14 the more basic it is. I plan to measure the pH of all three species and compare this to the types of lichens present
There are certain lichen species that are sensitive to specific air quality parameters. For example, some species can survive with higher atmospheric nitrogen levels than others. I found that many species are affected by this and are unable to survive. I believe a similar correlation can be made with bark pH. My intent is to verify this correlation in one area near Crescent Valley High School in North Corvallis.

Methods:
Bark ph–

1. We scraped some bark from the tree into distilled water (pH 7.0) and let it soak.
2. After 24 hours, we took a measurement with a pH probe.
3. We recorded our results in a table similar to the one below.

School Name	
Sample date	
Tree number	
Tree Species	
Latitude	
Longitude	
pH of Bark	

Lichen Sampling –

1. Using a 100 circle grid, we placed it on the tree at 1.5 meters from the base of the tree trunk.
2. We selected 3 mature trees of each species for your sample and marked each tree for later identification. At each selected tree, we tied a string around the trunk at a height of 1.5 meters from the ground.
3. We determined the Latitude and Longitude for each tree in our sample using a GPS
4. Using the 100-circle grid, we placed the transparent grid so that its lower edge touches the string. The center of the grid was lined-up with magnetic north (determined from a compass)
5. We counted each lichen that showed through each of the 100 small circles on the transparency and recorded the results on the chart below. The procedure was repeated for each tree.

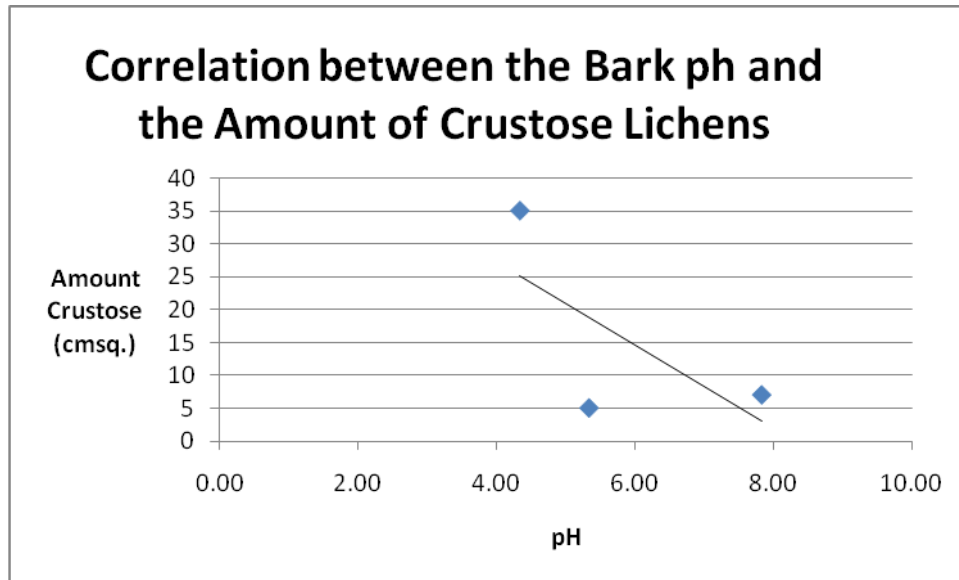| Tree #	Amount
Crustose	
Foliose	
Fructose	
Moss	
Bare Bark	
Other	

Note: Each column should add up to 100.

Results:
Overall, the results for this study were interesting. The graphs below show the correlation between the Ph of the bark and the amount of the different types of lichens found on each tree. The average pH of the alder bark was 4.33, garry oak was 5.33 and maple was 7.83.

Data – Note: data is hypothetical

Tree Species	Average PH	Avg.Amt Crustose	Avg Amt. Foliose	Avg. Amt. Fruticose	Avg. Amt of Moss	Amt. Bare Bark
Alder	4.33	35	5	10	0	50
Garry Oak	5.33	5	15	25	5	50
Maple	7.83	7	25	15	0	55

Discussion:

Correlation between the Bark ph and the Amount of Crustose Lichens
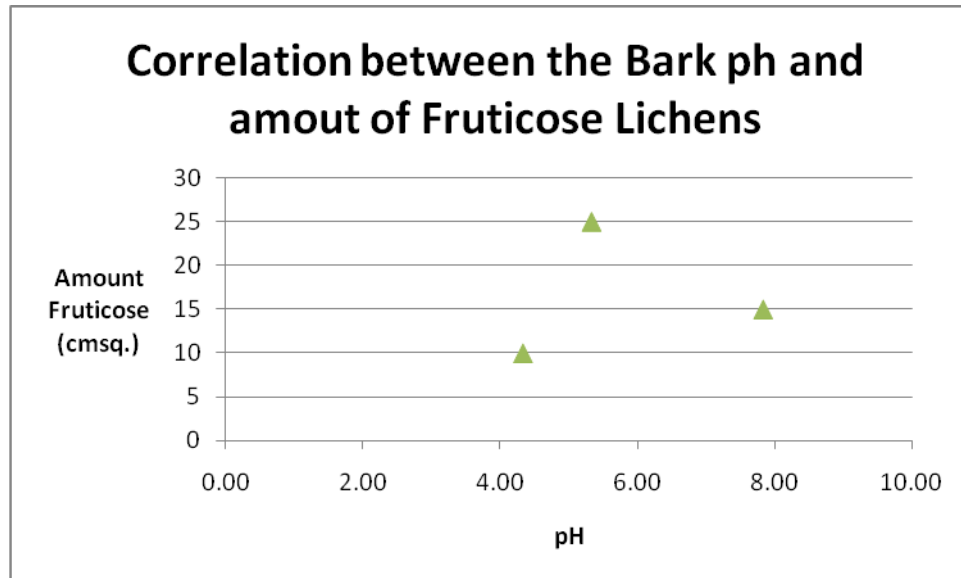
This graph shows the correlation between bark pH and the amount of Crustose lichens found on each tree. This is a negative relationship, basically stating that as the pH of the bark increases the amount of crustose lichens decrease. We could further our analysis by saying that crustose lichens tend to be more abundant on trees with a lower pH. These are conditions that are consistent to that of an alder tree.

Correlation between the Bark ph and the amout of Foliose Lichens
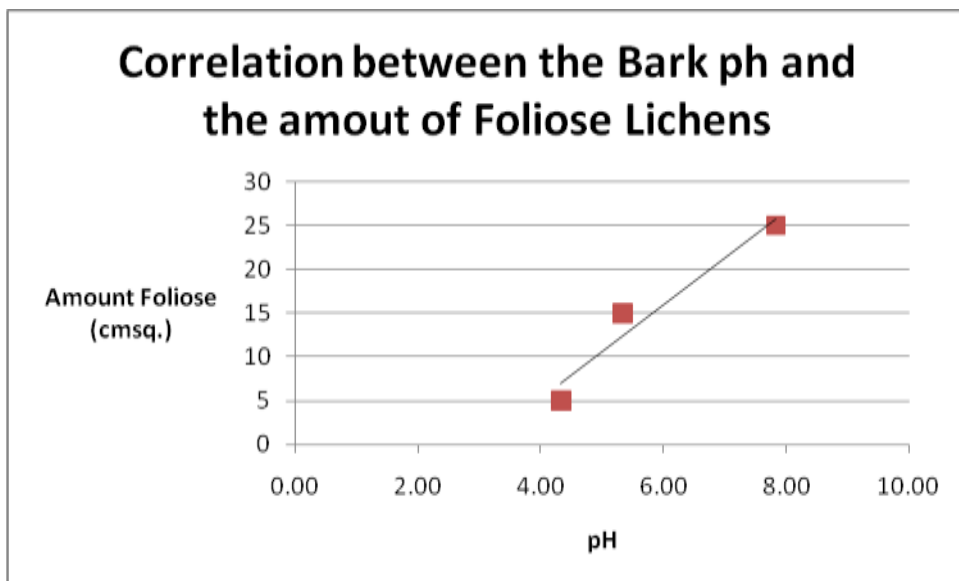
This graph shows the correlation between bark pH and the amount of Foliose lichens found on each tree. This is a positive relationship, stating that as the pH of the bark increases the amount of foliose lichens increase. We could further our analysis by saying that foliose lichens tend to be more abundant on trees with a higher pH. These are conditions that are consistent to that of a mapel tree.

Correlation between the Bark ph and amout of Fruticose Lichens

This graph shows the correlation between bark pH and the amount of fruticose lichens found on each tree. This is a weak postive relationship, which states that as the pH of the bark increases the amount of fruticose lichens increases. The results from this portion of the study may indicate that fruticose lichens may prefer a more specific ph rather than one that is high or low. More testing will have to me completed to confirm this hypothesis.

Other ecological factors could be influencing the results. I noticed that the bark texture was different on these trees. I also observed that the the alder trees were closer to the stream that the other trees. It would be beneficial to check other alder trees that are a similar distance from the stream as the maple and the oak trees..