What is leaf litter?
Diana Judy

Summary

Students will examine leaf litter to determine its composition.

General Goal

Students will use a variety of methods to examine leaf litter to determine "What is leaf litter?" - Essentially what are the parts that make it up?

Duration

2 90-minute blocks

Specific Learning Objectives

1. Students will recognize there is living and non-living parts to leaf litter.

2. Students will recognize that leaf litter is an ecosystem with different levels of biodiversity.

Pre-requisite Knowledge / Skills for Students

1. Students should be familiar with concepts of life: organization, growth/development, reproduction, response, adaptation, evolution. These concepts will help them to differentiate between living and non-living.
2. Students should know how to use a microscope.
3. Students should know how to collect and record data. This will have been covered during the introduction to science and the activities done on how to collect and record data.

Background Information

Leaf litter has been described as a "poor man's rainforest." It is a world with a great variety and number of living creatures. One article, from Australia, compares it to a coral reef based on its biodiversity. Most of the important inhabitants are arthropods, many of which are decomposers, along with protists, bacteria, fungi, and worms. The interactions within the leaf litter (and soil litter) help to maintain soil fertility and structure. Nutrients that are locked up in dead organic matter are released through a complex food chain.

Preparation

Materials

1. leaf litter collection bags or containers
2. hand lens or magnifying glass
3. Petri dishes
4. microscope slides and coverslips
5. microscopes
6. leaf litter

Preparation

Locate and familiarize yourself with your collection site.

Instructional Strategy

1. Introduce the activity – "Today we are going to be investigating the real world of biology. Each of you has a 3x5 card on which you need to write your name and then tell me, WHAT IS LEAF LITTER?" - at this point collect the index cards. (assessment)
2. Show the class a sample of leaf litter so they know what we are going outside to study. Have students collect necessary materials and head outside to our observation site.
3. Present the student with the job of discovering what leaf litter is through direct macroscopic observation at the site (including sifting through the layers down into the dirt a couple of inches). They should write down their observations and make drawings of what they see. (about 15-20 minutes)
4. Students next should use a common garden trowel to collect a leaf litter sample to bring back to the classroom. They should be sure to collect soil as well as the leaf litter.
5. Back in the classroom they need to put samples into a Petri dish and use the dissecting scopes and tools to further pick apart the material and see what it really is made up of.
6. Students next need to take a small vial and put leafy samples and soil samples in and add water. They should then make wet mounts and observe under the scope.
7. Give the students a new 3x5 card and ask them once again, "What is leaf litter?" (assessment)
8. Collect the students written observations and drawings to use for evidence to support the answer to the question "What is leaf litter?" (assessment)

Reflections

I made some changes with this activity. Instead of going out to the trees that bordered the school property, I had the students collect leaf litter samples from home. They were assigned to draw a picture of the place where they collected the leaf litter as well as to verbally describe it. I still started the activity with the question "What is leaf litter?". The students did this at the end of the block. They were then given the weekend

plus Monday to collect their samples. I told them to either collect enough to fill a Cool-whip container or a quart plastic bag.

On the day that it was due, the students turned in their bags of leaf litter and the pictorial and verbal descriptions of the site. I had emphasized to the students to write down the critters and plant material they saw when they collected their samples. The kids did a so-so job on their written/pictorial observations. They were excited when they brought their samples in talking about everything that they uncovered. This class just does not care if they lose points or not.

The next day we took out the samples (some students brought theirs in late) and started the observations. The students first used their eyes, then hand lenses and finished up with dissecting scopes. They were enthralled with everything they saw. Unfortunately, getting them to focus on the plant parts/material or etc was not an easy thing. Everyone focused on the animals. I had the students make sketches of what they saw. Next they went on to the wet mount step to see the microscopic components of leaf litter. This also interested them. They spent the entire 90 minute block searching through the samples. Several students went back and did a macroscopic observation a second time because they wanted to find some "COOL" stuff that was different or better than anyone else's.

I finished the activity with the students by once again having them answer the question of what is leaf litter. Their answers were more detailed about what it was. I had the students refer back to their textbooks to see if leaf litter was mentioned in the ecology chapter. A couple kids went on line and checked out sites about leaf litter and told the class what they found (extra credit). There were 2 questions about this activity on the final exam since it was done during the review time.

The other biology teacher was very impressed with the activity. He was pleased to see how excited and on task the students were. We plan to run this activity but try it both ways next year. We are going to take our classes out to the tree border and collect leaf litter samples. The other part is to have the students collect samples from home to make comparisons of what kinds of life are found in each. I am going to create a very much more guided lab sheet to go with the observation of the sample in the classroom. I hope that this will help to encourage better record keeping and data collection of the lab materials. We plan to use this activity early in the year when we do the introduction to ecology chapter or with the introduction of lab skills. I am not real sure yet, we still have to meet to decide where to put it in the curriculum.

I plan to use this activity with my AP biology class as well but with a few modifications. I think we are going to do the activity twice, in the fall and then in the spring after the AP exam to see if the organisms are the same or different depending on the time the sample is observed.