

What's in the dirt?

Summary

This simple experiment will provide students an opportunity to observe changes in a small environment.

Materials

- Paper towels
- Wax paper
- Cookie sheet
- Paper Clips
- Illustration Of Berlese Funnel
- Heat lamp
- Wide mouth jar
- Netting or wire screen
- A large funnel (metal, paper cup, plastic)
- Slightly damp soil sample with plant litter
- Heavy / thick rubber band
- Medium gauge wire
- Microscope
- Science journals

Background for Teachers

Slight changes in an environment can bring about large changes to a living organism. Organisms that live in the soil like the environment to be cool, dark and moist. Using a Berlese (pronounced "bur LAY zee") funnel, we can add heat and light to the topsoil, thus drying out the sample and forcing the organisms to escape this change. Students do understand that with a change of seasons, their own environment is affected. How can this same principle be applied to other living organisms? This simple experiment will provide an observable change in a small environment.

Intended Learning Outcomes

1. Use science process and thinking skills
2. Manifest Scientific Attitudes and Interests
3. Understand Science Concepts and Principles

Instructional Procedures

Invitation to Learn

The instructor should invite students to observe. The instructor will wet down individual paper towels to the point of being wet but not dripping. Once done, place one paper towel on a cookie sheet out flat, a second paper towel, roll-up a second lengthwise and paper clip to keep it rolled and place it on cookie sheet. Place the last paper towel between two sheets of wax paper, roll lengthwise and paper clip each end to keep rolled. Ask students to make a journal entry prediction. How will the passing of time affect each towel? Entries could be based in 30 minute, one hour, and 24 hour increments for each towel. When time has lapsed, ask: "What has happened to the moisture in each paper towel over time? Can this same change be applied to a living organism? What might happen if these samples were outside?"

Instructional Procedures

Construct a Berlese funnel to be used in the classroom. The purpose of the funnel is to make

available a small environment that can be heated and allow the students to observe what effect the heat has on organisms living in the soil, if any.

Place wire screen over the narrow end of the funnel and mold to shape of funnel end. Place elastic band or wire around screen to hold in place.

Invert funnel over large empty jar. A clean, white folded paper towel could be placed in jar bottom.

Carefully pour soil sample into funnel. Wire mesh should be fine enough to prevent soil from coming through.

Position heat lamp over soil sample to heat and dry out sample. Leave light on for several hours or overnight, if possible.

The change in moisture content and soil temperature should drive the soil organisms farther down in the soil and force them out into the jar.

Discussion-- "What change took place on the nonliving soil when the lamp was turned on?"

"What happened to the organisms living in the soil when the heat was added?" "How is this like a human being out in a desert?"

Journal entry-- What part does the soil play in this small environment? What part does the heat lamp play or what is the lamp like in our environment?

Extensions

Curriculum Extensions/Adaptations/ Integration

Distilled water could be added to jar to collect organisms that could be viewed with microscopes.

Soil samples could be collected by students from different areas such as cool shade, near ditch banks, open fields, sandy soils, etc.

Paper towel activity could also be done in a shaded area and/or in full sun. Students would predict and log outcome differences specific to this areas.

Family Connections

Students could make a Berlese funnel at home to share with family using a plastic bottle cut in half, inverted over bottom half of bottle and using a desk lamp.

Assessment Plan

Journal entries-- Response to the paper towel activity, predictions and question answers.

Draw, in journals, what they see at the bottom of the jar. Write a description of organisms found in bottom of jar.

Make a chart showing, on a scale from 1-10, one being dry to 10 being damp, how the paper towel feels after 30 minutes, one hour, three hours, 24 hours.

Bibliography

Research Basis

Shaw, E.L. Jar, Baggett, P.V., Daughenbaugh, L.R., Daughenbaugh R.L., & Santoli, S. (2005) from boxed lunch to learning boxes: an interdisciplinary approach. *Science Activities*, (Fall), pp. 16-25.

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Science can be a method for enabling students to interpret the world around them. Students should ask questions, make predictions, test and retest, make observations, construct events, and then attempt to communicate this information to another person or write it down. This article refers to patterns that are observable. Students will make journal entries about changes, over time, and how those changes have an effect on a living thing in an environment.

Authors

