



Forestry

About the plan

EDUCATOR'S NAME	Sandra Jo Murphy
SCHOOL	Caledonia Elementary School
DISTRICT	Lowndes County School District
GRADE LEVELS	3-5
SUBJECT	Science
UNIT/THEME	Ecosystem Relationships
OBJECTIVES	<ul style="list-style-type: none">• Students study the relationship between the types of trees, soil, and organisms in the forest ecosystem.• Students examine the trees/forest in the local area.• Understand systems, with the importance of organisms on the forest growth, thus maintaining the sustainability of the forest.• Students use a naturalist approach of multiple intelligences and learning styles for this study by distinguishing among and classifying features in the forest.<ul style="list-style-type: none">○ Investigate and understand the complex interactions and cycles at work in the forest.○ Understand the factors that contribute to a healthy, sustainable forest.○ Identify, classify, and grow cultures from samples collected in the forest.
INSTRUCTIONAL FORMAT	Partners, whole group and small cooperative groups
PRIOR PREPARATION	Students have to be assigned partners and working space. Students will be given containers for collection of soil before returning to the classroom. Data sheets for observations and recording growth of cultures need to be prepared, with organization of materials, equipment, and clear directions.
MATERIALS NEEDED	<ul style="list-style-type: none">• Funnel• Muslin bag• Ring stand• Hose and clamp that will fit over the funnel• Petri or evaporating dish• Sieve or kitchen strainer• Hand lens

	<ul style="list-style-type: none"> • Microscope • Dissecting or compound microscope • Science journals • Homemade Agar: potatoes, rice, boiled water, salt, beef broth, gelatin • Small containers • Latex gloves
DURATION OF ACTIVITY	1-2 hours, with continual observations for several days during the growth of cultures
FORMAL ASSESSMENT	<p>Teacher observation and questioning: move around the room, watch, listen, and assess.</p> <p>Students are to demonstrate reasoning, problem-solving, analysis, and communication skills. Data collections will be assessed in their science journals daily. Observations, data, and evaluations will vary with the different work samples.</p>

Procedures

Students will collect the samples in small containers, prepare their Baermann funnel for their collection, let it stand overnight, and prepare the Agar for the cultures to grow. The next day, collect the samples and put a small amount on the Agar for growth. Prepare experiment, predict outcome, observe, record, and compare different samples from different locations.

Explore activity

Nature Trails With a Twist, by Dr. John Guyton, MS State University Extension Service, Coastal Research and Extension Center, Biloxi, MS

Baermann Funnel

Background:

The Baermann funnel is used to examine soil nematodes. Nematodes, a small round worm, may be parasitic or saprophytic.

Materials:

Funnel, muslin bag, ring stand, hose and clamp that will fit over the funnel, petri or evaporating dish, sieve or kitchen strainer, and a hand lens, bioscope, dissecting or compound microscope

Procedure:

1. Construct the apparatus with petri dish on the bottom stand, hose and clamp suspended underneath the funnel and muslin bag containing the soil sample.
2. Collect a soil sample from under leaf litter and place in muslin bag.
3. Place muslin bag in a sieve or kitchen strainer (which is in the funnel.)
4. Make sure the hose clamp is closed and cover the bag in the funnel with water. Nematode larvae are attracted to warm water (45 degrees C or 113 degrees F.)
5. Allow water to stand 24 to 48 hours.
6. Drain water into the petri dish.
7. Transfer some of the water to a bioscope view chamber. Place on a microscope slide or on a flat non-absorbent surface and observe the nematodes and other soil microbes.
8. Sketch pictures of what you are observing.

Extension:

Soil nematodes can be cultured and the various stages of development examined. Sprinkle soil infested with nematodes on prepared sterile petri dish of salt Agar medium by heating 5g NaCl and 15 g agar in 1 liter of water. They can be examined under a dissecting microscope or a few drops of water containing nematodes could be placed on a slide with a cover slip for examination under higher power.

Homemade Agar

Boil rice or potatoes until well cooked, then drain and save the water. Use the water to prepare some gelatin. Add a pinch of salt and a little beef broth (or bullion cube) to the gelatin. Pour into a petri dish the depth of 3-4 mm. Cover and wait until the gelatin has hardened.

Project Learning Tree Environmental Education Activity Guide, American Forest Foundation, Washington, D.C., 20036

Using MAGNOLIA, click on [EBSCO Host](#). There, type in "forest ecology." "Forest Ecology - Study and Teaching" from [Highlights for Children](#) by Jack Myers will appear. AN: 9604151559 ISSN: 0018-165X Lexile: 880.

At the MAGNOLIA [K-12 Site Discovering Collection](#), under "Classroom Topics," have students click on to "Old Growth Forests." Source: [Gale Encyclopedia of Science](#). This includes summary, definitions, and pictures of old-growth forests. Students can write a brief research report using this site and similar sites.

Under MAGNOLIA, students can also type in "ecosystem" at the [Searchasaurus](#) link. Searching the "Biology" page, have students download article called, "The Busy Life of a Rotting Log." Source: [Ranger Rick](#), 1997, Lexile: 790. Students can work in pairs for this activity: Take a magnifying glass and a guidebook to identify insects, spiders, and other creatures. Take a notebook and pencil to write down and to draw what student sees. Students tap on the log. Does it sound hollow or solid? Is it wet or dry? Is it soft or hard? What is growing or crawling on the outside? Is the bark still attached? Look at the inside of a piece of bark for tunnels made by beetles and their larvae. If the log is soft, carefully break off a chunk. What is inside? Check out part of the log that is exposed to the air. Use your magnifying glass to look closely. Record what you see. Break the chunk apart and shake it over a sheet of white paper from your notebook. What falls out? Describe the different kind of animals, plants, mushrooms, and organisms. Students will be graded on their active participation and accurate record and diagrams.