

Spores to Compost: A Growing Cycle

Objective

Students will

- Learn the role of fungus in decomposition.
- List the steps in mushroom production.
- Draw a model showing the life cycle of a mushroom.
- Design and conduct experiments with mushroom compost.

Procedures

1. Bring mushroom compost to class.
2. Divide the class into groups and provide each group with a small sample of the compost.
3. Provide copies of the reading passage describing the steps in mushroom production, from spore to compost.
4. Discuss the movement of matter in an ecosystem.
5. Students will develop a model, based on the reading passage, to show how matter moves in the mushroom cycle, from plants (hay, straw, cottonseed and animals (chicken manure) in the compost starter, decomposers (mushrooms) and into the environment (mushroom compost for fields and gardens)
6. Students will use the Scientific Method Format provided with this lesson to design experiments with the mushroom compost (planting seeds and comparing with other planting medium, ph testing, etc.).

Oklahoma Academic Standards

GRADE 3

Life Science 1-1; 4-3

GRADE 4

Life Science 1-1

GRADE 5

Life Science 2-1,2

Materials

mushroom compost, garden soil or other planting medium, pots, ph testing kit, gloves and other materials for conducting experiments with mushroom compost

Spores to Compost: A Growing Cycle

Growing a mushroom from spore to harvest takes at least 10 weeks of time. The mushroom starts in a laboratory where the spores are germinated and form the thread-like fibers called “mycelium.” Tiny pieces of these fibers are placed on millet seeds and then incubated.

Next the mushroom mycelium is delivered to a mushroom farm. Here it is cast by hand into an eight-inch deep bed of pasteurized compost. Hay, straw, chicken manure and cottonseeds are some of the basic ingredients used to make the compost. The compost is pasteurized so that any germs or bacteria that may harm the mushrooms are destroyed.

The heat and the humidity in the mushroom house are carefully controlled. Computers are often used to help monitor and regulate the growing conditions.

After about two or three weeks, the compost is covered by the mushroom mycelium. At this time peat moss is layered over the mycelium. The room temperature is dropped to 60 degrees, and the humidity is raised to 95 percent. In another two to three weeks the mushrooms are fully grown above the peat moss and ready to be picked.

After the mushrooms are harvested, the compost where they were grown is still valuable. This spent mushroom compost is removed from the mushroom house and recycled in people’s gardens, spread in farm fields and used to reclaim strip mines and other environments.

In the space below write the steps for growing mushrooms from spore to harvest.

Mushroom farming represents an ecological cycle—from plant to decomposition and back to plant again. Draw a model of the cycle represented by mushroom farming. Where are the mushrooms in this process? Is there an end product? What is it?

Scientific Method Format

Title of Experiment or Study:

I. Research Question: What do you want to learn or find out?

II. Forming the Hypothesis:

What is known about the subject or problem, and what is a prediction for what will happen?

III. Experimenting: (Set up procedures)

This should include: materials used; dates of the experimental study; variables, both dependent and independent (constant and experimental); how and what was done to set up the experiment; fair testing procedures.

IV. Observations:

Includes the records, graphs, data collected during the study.

V. Interpreting the Data:

Does the data support/defend the hypothesis?

VI. Drawing Conclusions:

Justify the data collected with concluding statements about what has been learned. Discuss any problems or concerns. Use other studies to support the conclusion. Give alternative ideas for testing the hypothesis.