

Mini-Ecosystems

Summary

Plan, make, and observe a balanced ecosystem.

Time Frame

2 class periods of 45 minutes each

Group Size

Small Groups

Life Skills

Communication

Materials

big glass jars (from restaurants), 2-liter or 3-liter bottles, or aquariums ***The number you need will depend on how many you choose to make.; various plants, insects, etc. depending on chosen habitats ***Most can be purchased from local pet stores. If not, order in advance from science catalogs.; reference materials if needed; science journals

Background for Teachers

Ideas and materials for different terrariums are listed below. You may prefer to have your students help research, build, and supply what is needed for each terrarium. If you do, plan on taking at least a week on this project. If money or time is an issue, have each class on your grade level make one and rotate the models or keep them in a central place where they can be observed.

Intended Learning Outcomes

Students will be able to describe the interaction of microorganisms within an ecosystem.

Instructional Procedures

Read *A Most Unusual Lunch* by Robert Bender to the class. Discuss the food chain represented in the book (beetle, frog, fish, snake, crocodile, lion). Which organism was the primary consumer? Which were secondary consumers? What do you think the beetle ate? (bark, leaves) Tell students that plants, fruit, nuts, and seeds are all producers. What would eat the lion? (accept reasonable answers) What would eat the lion if it died? (bacteria, fungi, earthworms, insect larvae) These are called decomposers. What role do decomposers have in an ecosystem? What might happen if there weren't any decomposers?

Tell students they are going to build their own artificial habitat, so they can observe this interaction more closely. Research and plan desired ecosystems as a class or in small groups. Make a master list of what is needed and make assignments of what to bring or collect.

Here are some ideas for ecosystems. This type of ecosystem should take care of itself. All you will need to do is research and include the food each animal needs. If you do not wish to add animals to your ecosystem, make a plant terrarium that waters itself. If you would rather make an artificial habitat, skip to 2.

WOODLAND: Plants- mosses, small ferns, liverworts, and tiny Virginia Creepers. Animals- small toad or salamander. Ground- small pebbles, charcoal, sand, and soil. Directions- layer sand, pebbles, and charcoal. Top with a layer of soil. Plant your plants. Then add an animal and its food supply. Observe

what happens.

POND: Plants- Cabomba, Vallisneria, Anacharis, or Elodea. Animals: guppies, snails, tadpoles, newts, crayfish, or water insects. Ground- aquarium gravel, charcoal, and sand. Directions- put a layer of sand on the bottom, then add a layer of charcoal. Top with a layer of soil. You may add shells, sticks, and stones. Fill with tap water that has been allowed to air out for 1 or 2 days or fill with pond water.

DESERT: Plants- Pincushion cactus, an opuntia, fishhook cactus, or nightblooming cereus. Animals- desert tortoise or horned lizard. Ground- potting soil, aquarium gravel, charcoal, and sand. Directions- mix the soil, gravel, and charcoal together and layer on bottom. Cover with a layer of sand. Add a small dish of water for the animals. Instead of an ecosystem, you can create an artificial habitat for pillbugs, silkworms, mealworms, earthworms, fish, ladybugs, caterpillars, ants, mice, etc. Each group could make their own in a big glass jar. Have groups decide what their animal or insect needs in order to live. Collect materials and prepare an environment that is similar to their natural habitat. You most likely will have to feed your animal. Once you have your materials, begin making your ecosystems or habitats. Observe your mini-ecosystems or artificial habitats for at least a couple of weeks. Instruct students to record daily observations in their science journals. Did you end up with a balanced ecosystem? How many animals were in your habitat each day? What were they doing? Did you notice any evidence of microorganisms? Ask students to write a paragraph describing the interaction of microorganisms within an ecosystem. When you are done making observations be sure to return your insects or animals to their natural habitats.

Extensions

Experiment by adding more plants or animals. What happens when more plants are added? What happens when more animals are added? Have students observe over a period of time and record observations in their science journals.

Have students draw and label a food chain for different habitats.

Play Oh, Deer! game/simulation found in the Project Wild manual.

Have students observe what happens to a small squash, apple, or other food item over a period of time. Place the item in a clear plastic container with a lid. Record observations in science journals.

Some items may take months to completely decompose, but it is fascinating to watch. Observe as the item is eaten by bacteria, liquifies, and begins to evaporate. You may want to dump the liquid into a flower bed for fertilizer.

Make a decomposition column, fermentation chamber, or ecocolumn. Information and directions are in the Bottle Biology book. The price is 15.95 + 3 postage. To order call 1-800-228-0810, fax 1-800-346-2377, or send to Kendall/Hunt Publishing Co. P.O. Box 1840 Dubuque, IA 52004-1840.

Take your class on a fieldtrip to Thanksgiving Point. They offer a microorganisms fieldtrip for sixth grade. The focus is worm composting and decomposition columns. The cost is 2.00 per student.

Payment is due 2 weeks in advance. Call for more details and to reserve your spot.

Watch any of the Magic School Bus series listed in bibliography or have students read the books.

Assessment Plan

Collect science journals. Look for recordings of observations and an explanation of how microorganisms interact within an ecosystem.

Bibliography

Bender, Robert A Most Unusual Lunch (Dial Books for Young Readers, 1994) Cole, Joanna Magic School Bus: On The Ocean Floor (Scholastic, 1992) May, John Magic School Bus: Meets The Rot Squad (Scholastic, 1995) Magic School Bus For Lunch (Video) (Kidvision, 1995) Cole, Joanna Magic School Bus Gets Eaten (Scholastic, 1996)

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