LETTER TO FAMILY

Cut here and paste onto school letterhead before making copies.

Science News

Dear Family,

Our class is beginning a new science unit using the **FOSS Environments Module**. We will investigate several different plants and animals to discover the structures and functions that serve in growth and survival and the environments that support their well-being, and attempt to determine the optimum environments for some of the organisms.

The news is full of discussions of the environment—environmental issues, environmental protection, environmental activism, and more. Environmental issues are complex because environments are complex. Our studies will not range into issues, but will deal with the more fundamental question: What is an ecosystem?

Ecosystems can be analyzed in terms of the nonliving components (temperature, moisture, light, and so forth) and living components (organisms). This analysis can take time and often requires close observation and interpretation of results. The interactions among the organisms in food chains and food webs, and the interactions of the organisms with the nonliving environment is the study of ecology. We expect to work with lots of plants and animals to start understanding how organisms flourish when provided with an environment that is just right for them.

Watch for Home/School Connection sheets that I will be sending home from time to time. The activities described on them suggest ways you and your child can extend the environmental inquiry into your home, neighborhood, and community. If possible, take a family field trip to a local aquatic environment to see what lives there and to ponder the environmental factors that affect those organisms there. At another time, you might set up a specialized environment in your home to raise brine shrimp, or embark on a minisafari, looking into microenvironments to see what insects and their kin are living nearby. Perhaps your discoveries will start some family discussions about environments and ecosystems.

We're looking forward to weeks of fun with organisms and their environments! You can get more information on this module by going to www.fossweb.com. If you have questions or comments, or have expertise you would like to share with the class, please drop me a note.

Sincerely,

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HOME/SCHOOL CONNECTION

Investigation 1: Environmental Factors

Insects live just about everywhere. Go on a safari with an adult in and around your home or into the neighborhood to look for insects. You might discover insects that are fun and interesting to observe, like butterflies, bees, moths, grasshoppers, and ladybugs. And, you might see insects that are less welcome, but equally interesting, like ants, flies, mosquitoes, and roaches.

You might also encounter some small animals that are not insects, but live in the same environments, like centipedes, millipedes, isopods, spiders, and worms.

Safety note. While most insects, spiders, and other small animals are harmless, some can sting (ants, wasps, bees), and some can bite (spiders, centipedes). Observe the animals without touching them (for your safety) and without disturbing them (for their safety and well-being).

Organize the results of your safari in one of two ways.

- If you find only one or two critters, identify them and describe their environments as best you can. Try to identify both living and nonliving factors in the organisms' environments.

- If you go to an environment and find a number of insects and other small animals living there, write a description of the environment (for example, dark, moist, cool). Then list or draw all the different animals living there.

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HOME/SCHOOL CONNECTION

Investigation 2: Ecosystems

Aquatic environments are homes to fascinating and diverse organisms. Aquatic systems can be as grand as a lake or ocean, or as ordinary as a mud puddle or neglected bucket of water. If you have the opportunity, visit an aquatic environment, like a beach, pond, stream, or canal. Use a collecting net and temporary observation container to see what plants and animals are living in, on, and near the water. Draw pictures to share with the rest of your class. Release the organisms back into the environment and make sure no harm comes to them.

If visiting an aquatic environment is not possible, search around your home and neighborhood for miniaquatic systems (puddles, gutters with standing water, or buckets left out to fill with water). Get down close and look carefully. Maybe scoop some water into a white-bottomed container, such as a half of a milk carton or a plastic bowl.

Describe how one plant or animal is influenced by a **nonliving** factor in the aquatic environment.

Describe how one plant or animal is influenced by a **living** factor in the aquatic environment.

Describe an example of environmental preferences that you observed in the aquatic environment.

If no natural aquatic environments are easy to get to, get a map of the area in which you live. Locate the aquatic environments nearby. List them in groups based on the kind of aquatic environments you locate: stream environments, lake environments, and so forth. Use the reverse side of this paper to make your lists.

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HOME/SCHOOL CONNECTION

Investigation 3: Brine Shrimp Hatching

Brine shrimp live in salt lakes (like the Great Salt Lake or Mono Lake) or ocean bays (like San Francisco Bay). In their natural environment, the mix of salts is fairly complex. The mix is certainly more complex than just table salt in water. Biologists who study brine shrimp have come up with a recipe for a more complete saltwater environment for the shrimp.

Metric units, using liter beaker and metric measuring spoons

1 liter	Pure water
20 milliliters	Rock salt (or other noniodized salt)
5 milliliters	Epsom salts
2 milliliters	Baking soda

English units, using measuring cup and teaspoon (1 teaspoon is about 5 ml)

4 cups	Pure water
4 teaspoons	Rock salt (or other noniodized salt)
1 teaspoon	Epsom salts
1/2 teaspoon	Baking soda

Stir up this brew. Let it sit in a container (like a cutoff 2-liter soda bottle) for a day or so to mellow. After the brine shrimp hatch, dump them into the new environment, hatching water and all.

Mark the water level with a piece of tape or a permanent marker. As the sea level goes down (evaporation), bring it back to starting level by adding plain water. Why plain water? Only the water evaporates, not the salts. If you renewed the level with salt water, soon the salt concentration would be too great for the brine shrimp to live.

You can keep the colony in a sunny window. The shrimp will need to eat. So dissolve a tiny pinch (seriously, a very little bit) of yeast in a little water. Put a drop of the solution in the brine shrimp container. Give the whole business a gentle stir to distribute the yeast throughout the environment. You can store the remaining yeast solution in the refrigerator. Feed the brine shrimp a bit of yeast solution every few days. Don't get the water too cloudy.

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HOME/SCHOOL CONNECTION

Investigation 4: Range of Tolerance

Work on these problems on another piece of paper.

Four friends want to plant a garden. One of their fathers said they could use an area in the backyard that was a rectangle 8 meters by 4 meters.

Fair plots

The friends want to divide the area into four equal parts. Each friend has a different way to divide the garden plot fairly. Show at least four different ways the garden could be divided. Which one would you pick for the garden? Why?

How much area to plant?

The friends have decided on a garden plan. They want to know how much area each person has for planting. One friend calculated and said that each would get 12 square meters to plant. Another said they would each get 8 square meters. A third said they would get 8 meters each. Only one of the friends had the correct answer.

What is the area of each person's piece of the garden?

A row of marigolds

The friends decided to plant a single row of marigolds along one of the 8-meter sides. They will start the row at one corner of the garden plot and plant to the opposite corner. Marigolds need to be planted 10 centimeters apart. How many marigolds will they need for the row?

A border for the garden

The friends really like the row of marigolds along one side of the garden. They want to plant marigolds around the whole garden. The border of marigolds will be planted along the outer edges, or the perimeter, of the garden. How many marigolds will they need in all to make a border for the entire garden?

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