Topic: Natural Community Profile

Grade: 4 - 6

Subjects: Science, art, language arts, math

Skills: Mapping, comparison and contrast, drawing, discussion, analysis, surveying

Objective(s): Students will list four requirements for life: food, water, shelter and space; define community; state how three plants and animals meet their needs in the forest community; diagram the interrelationships among the plants and animals in the community in which they live; and compare the natural community investigated with the human community where the students live.

Standard Categories: Watersheds and Wetlands Environmental Health Ecosystems and their Interactions Threatened, Endangered and Extinct Species

Standard Statements:

> 4.1.4.E Recognize the impact of watersheds and wetlands on animals and plants.
> 4.3.4.A. Know that plants, animals and humans are dependent on air and water.
> 4.3.4.C. Understand that the elements of natural systems are interdependent.
> 4.6.4.A. Understand that living things are dependent on nonliving things in the environment for survival.
> 4.7.4.A. Identify differences in living things
> 4.7.4.B. Know that adaptations are important for survival.

Assessment Anchors:

> $.A.2.1 Apply skills necessary to conduct an experiment or design a solution to solve a problem.
> S4.A.3.1 Identify systems and describe relationships among parts of a familiar system
> S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.
> S4.A.3.1 Identify systems and describe relationships among parts of a familiar system
> $.B.3.2 Describe, explain and predict change in natural systems and the possible effects of those changes on the environment.
> S4.A.3.3 Identify and make observations about patterns that regularly occur and reoccur in nature.
> SB.1.1 Identify and describe similarities and differences between living things and their life processes.

Materials/Resources: Lapboards, pencils, paper, Student Data Sheets; Natural Community Profile Sheet 1, p. 68, Sheet 2 p. 69 and Sheet 3 p. 70 (PA Songbirds Guide), string.

Pre-Instructional Planning: Familiarity with outdoor community to be investigated; game commission and web research for contacts/pictures of natural communities.

Introductory Activities (motivation) Do Now Activity: "Name four things animals need to survive."
Write in journal.
Background: All organisms require food, water space and shelter to survive. The plants and animals living together in an area that meets their special needs for energy and nutrients is collectively called a community. All of these plants and animals interact with their surroundings and one another. They are dependent on each other and independent of each other. Human communities are similar to natural communities in that they attempt to meet the special needs of the people living in the community. They are also subject to the same ecological principles that govern natural communities.
PowerPoint: Natural communities

Developmental Activities:
1. Discuss goal: To discover how plants and animals meet their needs for survival.
2. How will we discover this? By taking a survey.
3. What is a survey? "A detailed examination to determine a condition; survival needs."
4. The following steps detail the survey procedure for determining the survival needs of
5. plants and animals in the forest.
    a. Choose a central landmark (large rock, stump, tree) for your area.
    b. Lay out 4 quadrants around the central landmark. Measure with 10 – 20 foot string or designate boundaries with trees, etc.
    c. Divide students into small groups of 3 -5 students.
    d. Have students make a map of group area. (Student Data Sheet # 1) On the map they should locate and label the various plants, animals, animal traces and nonliving things; rocks, trails, logs, etc.). Review with students where to look for animals and animal traces.
    e. As plants, animals and nonliving things are mapped and identified, they should be listed on Student Data Sheet #2.
    f. Students then select three of the plants and three of the animals from their areas. Students investigate and record how these plants and animals meet their needs.
6. Regroup students and have each group report its findings. As each group reports, all students should add plants, animals and nonliving things that they do not have on Student data Sheet #2.
7. Questions. How many different plants did you find? Were there more larger plants or smaller plants? Why? Is there any way we could classify these plants into different groups? (Canopy, understory, shrubs, groundcover) Do you think some of these plants require more air, sunlight, water or food than others? Why? Do you think all the smaller plants will stay the same size they are now? Which ones might grow larger and which ones might stay the same? What might prevent some of these plants from meeting their needs and growing larger? How do plants meet their requirements for space? What happens when plants get too crowded? How are plants protected or sheltered? (Bark, grow close to other trees that provide windbreaks, grow in valleys or hillsides away from wind, thorns). How many animals or animal signs did you find? Do animals meet their needs the same way as plants? Ask several students to identify one of the animals they found and ask how it meets its needs. (Mention both carnivorous and herbivorous animals) Do the animals depend on the plants? Trace relationships. Do plants depend on

animals? (Plants are pollinated by animals. Animals break up plant material for decomposition, animal waste is nutrients.)

8. Discussion and introduction of terms. Producers, consumers and decomposers. What role does an oak tree/honeybee/flower play in the community? Special role each animal or plant plays in the environment is called a Niche. Each plant/animal fills a special niche that helps the other community members or the community. What jobs do people have in your community that help you? Community: group of plants and animals living together in an area that meets their special needs for energy and nutrients. Draw a food web.

Concluding Activities:

How do plants and animals living in community help one another? On student Data Sheet #2, draw lines between the plants the animals and the things they depend on to meet their basic needs.

Discussion: Is a human community like a natural community? Ask students to look at the maps they drew in step 8. The map represents a community. Correlate each member of the natural community with a member of the human community; i.e. oak tree/grocery store, decomposers/recycling plant. Find a role for each part of the natural community in the human community. Which community works better? What would we have to do to be more like a natural community? (Decompose waste on site, grow food locally) Can we do that? Why/not?

Student Assessment

Choose three animals and three plants living in a natural community of your choice. Complete Student Data Sheet #3. Diagram the interrelationships among these plants and animals in the community in which they live, demonstrated as a food web in class (Developmental Activity #13).

Differentiation of Instruction

Students work individually or in small groups to design a model community that meets the needs of its members with as few environmental problems as possible. Be sure to include the community's needs for space, water, food, shelter and clean air. Etc.

Students pick one animal and plant out of the community and draw their shared habitat with food, shelter, water and space requirements of both.

Credit: PA Songbirds Teachers Guide p. 64, Natural Community Profile.