To Know a Tree: Identifying Natural Communities

Essential Question: What species relationships can be identified on and around trees?

Introduction/Background:

Trees are the basic structure and function of all forested ecosystems. Trees provide food and shelter to many organisms in their ecosystem as well as provide energy through their biomass (trunks, branches, leaves when they die or drop their leaves each autumn). This activity allows you to get to know a tree in your local forest and see that a tree is host to many other species and is an "ecosystem onto itself."

National Science Education Standards:

Content Standard A: As a result of their activities in grades 5-8, all students should develop an understanding of:

- Scientific inquiry.

Content Standard C: As a result of their activities in grades 5-8, all students should develop an understanding of:

- Populations and ecosystems.
- Diversity and adaptations of organisms.

Student Learning Objectives

As a result of this activity, students will
- complete a scientific inquiry.
- identify characteristics of organisms.
- explain the interdependence of organisms.
- describe the structure and function of organisms in an ecosystem.

Materials List

Field Guide to Trees (See Resources/References)
DBH tape (or a flexible metric tape. Then convert circumference to diameter: circumference/ 3.14)
Sketching/Construction Paper (at least 10 in. by 8 in.)
Pencil/Colored markers or crayons
Carpenter's contour gauge

Clip board
Compass
Field journal

Procedure

Select a tree in your forest plot that has a "DBH" (**D**iameter at **B**reast **H**eight which forest scientists measure at 1.3 meters above the ground from the base of the tree). On construction paper, prepare a poster of that tree that includes:

1. Common and scientific names,
2. A sketch of the leaf (simple or compound) and branching pattern (opposite or alternate), and
3. A sketch of the flower and fruit (with a discussion of how it is pollinated and mechanism for seed dispersal) and "phenology" (When does it flower?).

Observe the tree carefully. Look for all the signs of living things that might live on or very close to it. (Don't forget the area of soil affected by the tree.) Make a chart of wildlife species that may use the tree and how they use it.

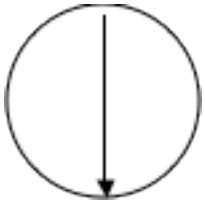
Using the "carpenters' contour gauge," trace the outline of the tree's bark (full 360^0) at standard DBH height above ground. Note the compass direction and DBH.

Example:

Tree Name: Red Oak (*Quercus rubra*) Alternate Branching/Simple Leaf

Sketch Leaf and Fruit (acorn)
When does it flower in your area? How is it pollinated?
What animals use your tree and the fruit it produces?

Carpenters' Contour Gauge Sketch of trunk:



North ↓ DBH = 12 cm

Sketch and note lichen and moss coverage on the N, S, E, and W sides at 1.3 M above ground.

Observations / Data

This will be your "poster" that includes your tree names (common and scientific) drawings, notes, and research.

North	South	East	West

Conclusions

In your field journal, review your poster and write a biography of your tree. Introduce your tree by common and scientific names, and then discuss what you learned about that tree.

Adaptations/Elaboration

A "community" is a group of interrelated living things. It has no set size. Quite often, a single tree can be considered the structural unit of a small community. Ask students to classify pairs of species that they have observed with respect to the specific relationships. Here are some examples:

Organism 1	Organism 2	Energy Relationship	Type of relationship
Tree	Moss	Moss uses tree for support	Commensalism
Tree	Bracket fungus	Fungus takes nutrients from tree	Parasitism
Tree	Caterpillar	Eats leaves of tree	Predation

Evaluation

Different students observing the same tree-based community will make different observations. Students can be given points for:

- number of living things observed,
- accuracy/precision of measurements,
- degree to which directions were followed, and
- scale and precision of drawings

Resources / References

Eastern Trees – Peterson Field Guide Series; Petrides, Wehr
Eastern Forests – Peterson Field Guide Series; Kritcher
Lichens of North America http://www.lichen.com/
Lichens and Air Pollution
http://ocid.nacse.org/classroom/lichens/denison/geninfo.html