



Inventorizing and Mapping

New activity A

Goal 1: Urban Forest Ecosystem
Concept: Mapping and Exploring

Overview

Tree inventorizing and mapping are important steps to become familiar with your urban forest. The information students gather from this inventory and the map they create will provide the foundation for many activities to follow.

Objectives

Students will be able to **1)** inventory trees in their area by recording tree names, height, diameter at breast height, and location; **2)** create frequency charts of three dominant species; and **3)** create a picture map of their study area to compare and contrast the distribution of trees and vegetation.

Materials

Inventory: Local map, tree identification book that also includes exotic species, pencils, measuring tape, clipboard, compass, calculator, data sheet, and protractor.

Mapping: Graph paper, pencils, large sheet of paper, markers, and scissors.

5 Flags: 5 wire hangers, tape, and 5 pieces of paper.

Background

Before students can make plans to understand, monitor, or potentially improve their urban environment they should first become aware of what exists. An urban forest is defined as the trees, shrubs, and other vegetation where people live, work, learn, and play. It is highly influenced by people, buildings, pavement, vehicles, animals, and other plants. It includes places such as schoolyards, street trees, neighborhood parks, vacant lots, and more.

A tree inventory is simply a list of trees and their characteristics. By doing an inventory, students will learn what kind of trees they have and how many are located at their site. Mapping local trees will enable students to know how they are distributed and become more familiar with their surroundings. In addition, educators can use this activity to assess what students know and have learned about their urban environment.

How to choose which trees to measure:

If your site is exceptionally large or has an abundance of trees, you can choose to work with a smaller area. However, choose a plot large enough to include a variety of species of trees of different sizes. We suggest choosing a study plot that is at least 100 feet by 100 feet. It is okay if your site is along a street or if it does not have a significant number of trees because this exercise can help youth assess and document the site.

Grade Level: 6 – 8

Time Considerations: 1–3 days

Subject Area: Math, Social Studies

Skills: Observing, Measuring, Comparing, Contrasting, Adding, Analyzing, and Concluding

Relevant Standards:

M.A.B.3.3 – The student estimates measurements in real-world problem situation

M.A.C.1.3 – The student describes, draws, identifies and analyzes two and three dimensional shapes

S.S.B.1.3 – The student understands the world in spatial terms

Getting Ready

- 1) To optimize safety, the educator should assess the site for potential problems.
- 2) Note the size of the area and divide it into 4 equal quadrants to be studied.
- 3) Make flags by unwinding a metal hanger and tape 1 piece of paper to one end.
- 4) Place flags at the 4 corners of your site and the middle to help students distinguish their quadrant boundaries.
- 5) Number the trees that will be used in this inventory and sketch a simple map that will help students locate designated trees.
- 6) Practice reading and making maps.

Pre-Activity Questions

- 1) Where is the urban forest?
- 2) If we want to make a record of the trees at our site, what kinds of information should we include?
- 3) What are some of the reasons why we would choose not to have trees here?
- 4) **Define:** urban forest, tree inventory, quadrant, circumference, diameter at breast height (DBH), and map.

Doing the Activity

Part A: Taking Inventory

- 1) Explain to students that they are going to conduct a tree inventory and later create a picture or a map of their area. Before students can make plans to monitor and improve their local urban environment, they should know what exists.
- 2) Assign students into one of the four teams to investigate each of the four quadrants.
- 3) Each team should fill out a data sheet which asks the following: tree name, circumference, height, and location.

Tree Name: Use a tree identification guide that also has exotic species to determine tree names. Match the actual tree's leaves, bark, flowers, or fruits to the one you find in the book. For more guidance on how to identify a tree, refer to the *Name that Tree* Activity #68 in PreK-8 PLT Activity Guide. For more information on trees in Florida check out the School of Forest Resources and

Conservation at University of Florida Web site: www.sfrc.ufl.edu/4h.

Height: Measure your shadow then your tree's shadow. Substitute and solve the following equation to find the height of your tree.

$$\frac{\text{Height of Tree}}{\text{Tree's Shadow}} = \frac{\text{Your Height}}{\text{Your Shadow}}$$

For more guidance on how to find the height of a tree, refer to the *How Big is Your Tree?* Activity #68 in PreK-8 PLT Activity Guide.

Diameter at Breast Height (DBH): To determine the DBH, measure around a tree at 4.5 feet above the ground to get the circumference then divide by 3.14 or *Pi*. Remember Circumference does not equal the Diameter.

$$\text{DBH} = \frac{\text{Circumference}}{3.14}$$

Example: If the tree circumference is 25 inches, divide this number by 3.14; DBH = 7.96 or about 8 inches.

Combine Your Results and Make a Class Bar Graph

- 1) What is the most common tree on your site?
- 2) Name 3 common trees in your area. How many of each do you have?
- 3) Graph tree height by number of individuals.
- 4) Graph tree DBH by number of individuals.

Part B: Mapping

The educator should show students a local paper map of their area or print one from one of the following Web sites. Point out a few characteristics that can help students read a map such as the use of symbols, scale, legend, north arrow, and the relative location of features.

- 1) Explain to students that maps are a bird's eye view of an area. Have students practice drawing trees, bushes, and buildings from this view.
- 2) Group students into several teams. Each team will use the following criteria to determine the quality of its map.

Good title: Short and descriptive

Effective use of symbols: Objects such as trees are well represented

Neat legend: It describes symbols well

Proper scale: Size and distance of objects are relative

Coordinates: The direction North is represented

Location of features: Group agrees with the location of features

3) Ask students what they remember about their study site and ask them to list both vegetation and human structures. This may include trees, shrubs, trails, grassy areas, benches, fences, buildings, parking lots, playgrounds, paved pathways, electric wires, water hydrants, sidewalks, and storm water drains.

4) If the study site is a schoolyard, the educator should attain a base map of the school grounds by asking the school maintenance department or planning board. Using a separate piece of paper each team should trace the scale and the property line, and identify features such as buildings, bleachers, streets, pathways, fences, hydrants, telephone poles, and storm drains. If students are not provided with a base map these features should be drawn to the best of their ability.

5) Lay out a 50-foot measuring tape on the ground. Ask students to walk along this tape at a regular pace while noticing the distance of each step. If students know their walking pace they can use this skill to help them determine approximate distances between objects outside. If the site is large, they can use their pace to measure the distance between objects.

6) Teach students to use a compass to measure the degree bearing from one object to another. When making the map they can use a protractor to space these objects on paper.

7) Students should go to their study site and map the location of plants and built objects on graph paper and later transfer this information on a larger piece of paper, preferably graph paper. The map and compass section of the 4-H Forest Ecology contest has helpful information for teaching students how to use a compass and pace (www.sfrc.ufl.edu/4h).

Post-Activity Questions

- 1) What can you do with a map that is clear and accurate?
- 2) Were any trees in your site smaller than others? Why?
- 3) Which trees are consistently the tallest with the largest DBH?
- 4) Which type of tree is the most common?
- 5) How are trees used on this site?

Assessment

- Have students write down the most common tree at their site. Each student should be able to name one tree, its height, and location.
- Collect completed data sheets and maps to determine if students accurately described known trees and calculated tree height and DBH correctly.
- Have students identify two differences between two different tree species.

Enrichment

Have students use a digital camera to take photos of their site. Allow time for teams to research information about trees in their study site and have them do group presentations with visual aids. An alternative is to have the class create a brochure or booklet about the entire study site for other students to use.

Related PLT Activities

How Big is Your Tree? # 67

Name that Tree #68

Looking at Leaves #64

References

Wolowicz, R.S and M. Gera, 2000. Tree inventory and systematic management. In: Kuser, John E., comp., ed. Handbook of Urban and Community Forestry in the Northeast. New York, NY: Kluwer Academic/Plenum Publishers: 95-106.

Mapping Resources

National Geographic Map Machine. United States Geological Survey Education Resource: Map lessons http://interactive2.usgs.gov/learningweb/teachers/lesson_plans.htm

Atlas, World theme maps, Street maps, <http://plasma.nationalgeographic.com/mapmachine>

United States Department of Education Office of Education Research and Improvement. Helping your child learn geography <http://www.ed.gov/pubs/parents/Geography/index.html>

Florida 4-H Forest Ecology Contest Web site www.sfrc.ufl.edu/4h

