

LESSON 28

Map Mysteries

OBJECTIVES

Students will be able to create a map of a local area featuring predominant plant species (both desirable and invasive species).

METHOD

Students work in teams to create a map including the predominant plant species. Students will learn about the mapping process used by land managers in addressing invasive plant issues.

MATERIALS

- ✎ Five 60-foot lengths of string
- ✎ 5 measuring tapes
- ✎ 5 rulers
- ✎ 5 compasses
- ✎ 5 or more large sheets of graph paper
- ✎ Field journals (or notebook for writing outdoors) *Optional: Use journals made in Lesson 4: Making a kNOweeds Journal of this guide*
- ✎ Pencils
- ✎ Copy of a basic map of school site showing buildings (obtain from school principal or go to <http://terraservertusa.com/> for printable maps that feature schools)

BACKGROUND

Developing knowledge of your surroundings, or “a sense of place,” is critical for building relationships that lead to effective stewardship of natural places and agricultural lands. Learning the mysteries of map-making can be so much fun that students may not even realize they are developing skills in map-reading, estimating, measuring and problem solving as they collect and record the data they need to create a schoolyard map. These skills are important for land owners and managers, as they are used to help address the spread of noxious weeds, wildlife habitat improvement, erosion, and other issues.

PROCEDURE

Explain to students that the class will be making a map of the schoolyard. As we add features to the map, we will record information about the vegetation that grows in the schoolyard.

1. For this activity, start with a map showing the dimensions of the schoolyard and school building(s). This usually can be obtained from the school and forms a “base map.” Show students the base map and ask how they would add to it. What features will they show and how do they think distances could be measured? Show students maps of local areas. Display a range of maps in class.

Grade level: 2-8

Subject Areas: Geography, life science, mathematics

Duration: Several class periods plus small group research time (can be done as homework)

Setting: Outdoors and Indoors

Season: Fall or Spring

Conceptual Framework Topics: Plant identification, weed management, citizen science and service, inventorying and mapping native and invasive plants

Extensions

Follow up this lesson by having students work in groups to design a restoration project for a weed-infested area in the schoolyard or area close to the school. Measure and record the dimensions of the proposed area. Have students design the area using the measuring, mapping and plant identification skills that they have learned. Their designs can be used to propose an actual project to the school administration. See **Lesson 30: Changes on the Land, Lesson 41: Pulling Together, and Lesson 44: The Restoration Cycle** from this guide for project ideas and resources.

Have students research web sites for additional maps and compare the types of maps and what features are available in maps, such as topography, vegetation, roads and buildings, etc.

2. Next take the class outdoors and explore the schoolyard, focusing on the area for which you want to create a more detailed map. Have students take notes identifying or describing the plants, in addition to the location of rocks, sidewalks, and other features they see. You may want to suggest that they create a chart to help organize what they find and the locations.
3. Ask students to sketch a rough map of the area in their journal depicting the main features they identified. Ask students to estimate what the distances are between features such as a wall of the school, the play area, a sidewalk, a tree, etc. Ask students how they will obtain the actual data.
4. Demonstrate how to hold the tape measure to get distances, and so on. Compare actual distances with their estimates. Discuss how to map irregular shapes using string placed along the outer border and noting where the string changes direction and at what distance from the last change.
5. Create 5 small groups and assign each group a few specific tasks in the collection of class data, such as one group being asked to determine the perimeter of the schoolyard or the length and width of the sidewalk. Continue until you have data on the features to include in the map.
6. Hand out large sheets of graph paper, one per group. These will become schoolyard maps. You may want to include the school on this map already to get students started, and the use of a simple scale of 1:100. This would make 1 centimeter on the map = 1 meter on the ground. Have each group include the following on their maps: a north arrow, a legend, a scale, a date, and a border. Guide students in the use of the compasses to find locate north on the map.
7. Proceed to add desired features onto the maps, such as:
 - Vegetation types and, if possible, what species of plants and their estimated numbers. This includes weeds.
 - Location of irrigation or other water sources.
 - Shaded areas and sunny areas.
 - Hills, ditches, or other topographic features.

Update the maps as the school site changes with the seasons, new plants invade or are removed or planted, or features like play equipment are added, etc.

8. Ask students if there are weedy areas found and drawn on their map. If the school were to remove the weeds and restore the area, consider what the area would be like. Would it include trees, shrubs and flowers? If so, what species would be desirable to plant?