Do You Know Your MUC?

Purpose

To determine and produce a land cover map of plant life at a site to determine the Modified UNESCO Classification (MUC).

Overview

Students classify land cover by visually examining their site as well as mapping and recording ground cover onto graph paper as they walk across their site. Students will use a GPS to locate the site in addition to photographing their site.

Student Outcomes

Students will learn to scientifically describe and classify a land cover sample site.

Science Concepts

Physical Science

Objects have observable properties that can be measured using tools.

Position of an object can be located by reference to other objects.

Life Science

Earth has many different environments that support different organisms.

All populations living together and the physical factors with which they interact constitute an ecosystem.

Geography

How to use maps (real and imaginary)

The physical characteristics of place

The characteristics and distribution of ecosystems

Creating a key for their map

Scientific Inquiry Abilities

Use appropriate field instruments and techniques to gather Land Cover Sample Site data.

Make observations in order to determine the appropriate land cover type.

Communicate the results of land cover classification to reach a consensus.

Identify answerable questions.

Conduct scientific investigations.

Develop descriptions and predictions using evidence.

Recognize and analyze alternative explanations.

Communicate procedures, descriptions, and predictions

Level

All

Time

60-90 minutes in the field (excluding travel time)

45 minutes for additional class work (combining and coloring final map)

Materials and Tools

Graph paper

Compass

GPS receiver

Camera

Pencil or pen

Landsat TM images of your 15km x 15km GLOBE Study Site

Local and topographic maps (if available)

Aerial photos (if available)

Local vegetation field guides

MUC Field Guide

GPS Protocol Field Guide (from GPS Investigation)

Land Cover Sample Site Data Sheet Biometry Protocol materials as needed

50 m tape measure

Markers for permanent sites

Clipboard

Background

In order for students, teachers, and scientists from all over the world to compare and discuss land cover, The GLOBE Program uses a system called MUC (pronounced "muck") for describing homogeneous land cover. A homogenous site is an area that has only one type of land cover on it. MUC stands for Modified UNESCO (**U**nited **N**ations **E**ducational, **S**cientific and **C**ultural **O**rganization) Classification. With MUC, you can describe a site with up to a four-digit class. When you use MUC, all of GLOBE will know what you are talking about. To learn more, read the Land Cover Sample Site Protocol Introduction.

What To Do and How To Do It

Give out the following scenario:

"Agent Malmberg from the GLOBE agency has requested our CSI team's help. Recently they encountered a computer virus (Spic 'n Span) that wiped out their database files. She needs us to go out into the field and collect all the necessary data and determine our MUC (secret code for type of land cover)."

Then, using the PBL (Problem Based Learning) format, the students first use a KWHL Chart (see Figure 1) to start their research. As they do this, they also need to start to ask the important W's (Who, What, Where, When, Why) and continue to ask these questions as they do their research and field work. During the first trip to the area, students do a mapping activity for determining land cover. Each student is responsible for their own section or row on their own piece of graph paper to determine and identify what they find. Subsequent trips to the area are then used to collect and

Figure 1: KWHL Chart- used to organize information
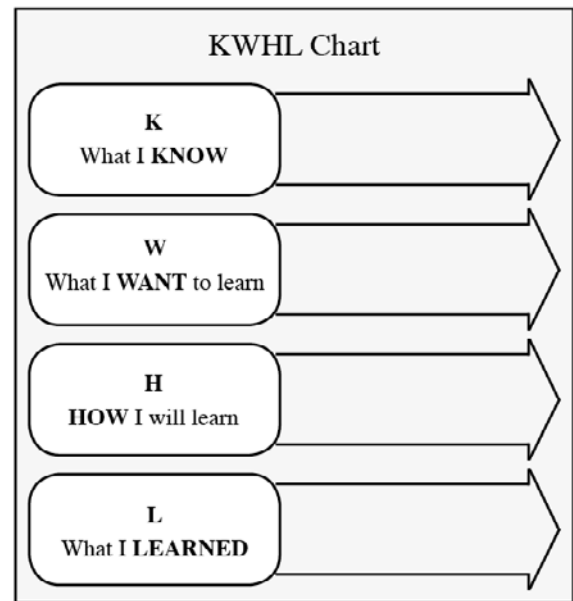
identify their plots and to collect other data to get a good "picture" of the study site. The other optional data collected consists of soil temperatures, soil types, air temperatures- both inside the woods and on the edges taken at the surface and 2 meters above the surface, UVA and UVB, and light intensity.
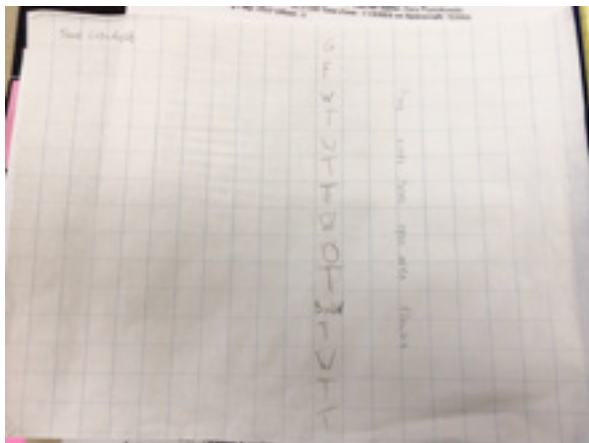
Figure 2

Procedure:

1. Each student receives a piece of graph paper.

2. Out in the field, students line up side by side, both arms extended out from their sides (Figure 2).

3. Students then number off from left to right.

4. They are assigned the same number row on their graph paper to record their observations (Figure 3).

Figure 3

5. Together as a group, they take one step forward, look down, observe and record the type of ground cover and any other observations the class is collecting (soil temperature, air temperature, et cetera). They will use their own descriptions, such as "jagger bush", dirt, weeds, et cetera (Figure 4). Continue until the students have gone across their whole study site. Later in class, they will discuss and organize

Figure 4

their descriptions according to the official language in the MUC handbook.

6. Collect the graph papers and have the students put all of their observations on one piece of graph paper (Figure 5). Students decide the key (letters, abbreviations, color etc.) to be used for their final map (Figure 6).
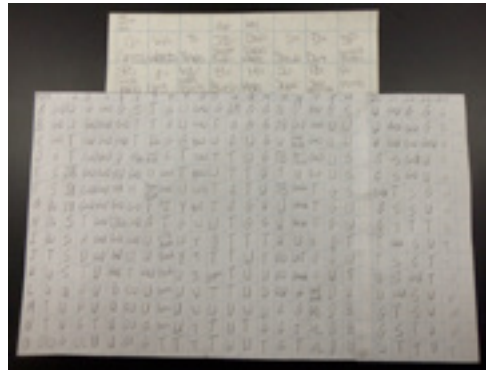
Figure 5

Figure 6

7. To finish the study of "Do you know your MUC?", students in groups are assigned to research one of the 5 or 6 most common types of land cover observed out in the field and then present to the whole class.

8. Finally, after hearing all of the presentations the class decides the MUC for their field site.