Forests Ecology Unit  
By Michael Randell  

Target: 7th and 8th Grade Geography  

Unit Overview:  
This unit will cover the five themes of Geography (location, place, movement, human/environment interaction, and region). This is a five-day unit plus one day of assessment with each day covering a different theme. The forests and the Upper Peninsula will be integrated into the five themes. Materials and presentations will come from the Forest Ecology and Resources Teacher Institute at MTU. Through discussion, critical thinking, and hands-on learning students will investigate the uses of a forest past and present. The unit provides plenty of movement in and out of the classroom.  

Sources Consulted:  
- The Forests of Michigan, Chapter 5 The Forests of Early Nineteenth Century Dickman and Leefers  
- Maria Janowiak, Northern Institute for Applied Carbon Science at MTU  
- Mr. Erik Lilleskov-Research Ecologist USDA Forest Service  
- MTU Trails Map, http://www.sportsrec.mtu.edu/images/newtrailmap0608_lowerprint.jpg  
- National Geographic’s: http://www.nationalgeographic.com/resources/ngo/education/themes.html  
- Poster rubric: www.saskschools.ca/curr_content/socst10_05/.../poster_rubric.doc  
- Wisconsin’s K-12 Forestry Education Program www.uwsp.edu/cnr/leaf  

Learning Objective:  
Students will be able to:  
- Define the Five Themes of Geography  
- Interpret a map  
- Evaluate and identify different types of trees  
- Illustrate and describe the Great Lakes Region  
- Calculate how much carbon is in a tree.  
- Describe the relationship between human and environment interaction  

Michigan and National Content Benchmarks:  
- **Earth Science**  
  o E1 Inquiry, Reflection and Social Implication;  
  o E1.2 Scientific Reflection and Social Implications;  
  o E2.2 Energy in Earth Systems;  

- **Geography**  
  o CG2 Resources –National Geography Standard 17 pg. 216  
  o CG3 Patterns of Global Interactions-National Geography Standards 6 and 11 pg. 195 and 206
Day One:

THEME 1: LOCATION
Every point on Earth has a specific location that is determined by an imaginary grid of lines denoting latitude and longitude. Parallels of latitude measure distances north and south of the line called the Equator. Meridians of longitude measure distances east and west of the line called the Prime Meridian. Geographers use latitude and longitude to pinpoint a place’s absolute, or exact, location.

To know the absolute location of a place is only part of the story. It is also important to know how that place is related to other places—in other words, to know that place’s relative location. Relative location deals with the interaction that occurs between and among places. It refers to the many ways—by land, by water, even by technology—that places are connected.

As a pre-test the students will journal or define what Location is in Geography. Students will be given five minutes to complete. Discuss the different definitions the students came up with for five minutes. The next five minutes will be used to hand out maps of the MTU trails (link on sheet 1), going over any rules the class may have and collecting permissions slips. The objective for this activity is for students to follow a map to complete a designed course. Time would be needed before hand to go over the trails and design a pathway for the students. A good idea is to put flags or paper (example on sheet 2) along the way for the students to pick up so you know they actually followed the map. How far the school is from the MTU trails or other trails will determine how long this field trip will take. My class would spend three hours out on the trail with a half-hour for lunch at the Nara building. We would leave in the morning and be back for afternoon classes. During lunch review what Location is and assign a homework assignment reflecting on the field trip and how it is related to Location (sheet 3). The Make sure all of the flags or papers are picked up before leaving the trails and the building is cleaned up before leaving.

Materials Needed: Flags and or paper, Maps of trails (Sheet 1), Permission slips, Homework (Sheet 3)

Day Two:

THEME 2: PLACE
All places have characteristics that give them meaning and character and distinguish them from other places on earth. Geographers describe places by their physical and human characteristics. Physical characteristics include such elements as animal life. Human characteristics of the landscape can be noted in architecture, patterns of livelihood, land use and ownership, town planning, and communication and transportation networks. Languages, as well as religious and political ideologies, help shape the character of a place. Studied together, the physical and human characteristics of places provide clues to help students understand the nature of places on the earth.

The question for the students when they walk in is what is the difference between coniferous and deciduous trees? They have three minutes to complete. Explain how trees may be used to describe a place (hardwoods stand, eastern hemlock, sugar maple, etc.) The next 10-15 minutes spent going over the key concepts of Mr. Erik Lilleskov-Research Ecologist USDA Forest Service presentation. The rest of the class will be spent out in the schoolyard using the tree
identification key (*Wisconsin’s K-12 Forestry Education Program* [www.uwsp.edu/cnr/leaf](http://www.uwsp.edu/cnr/leaf)).

Outside go through the identification key on a few trees to show the students how the sheet works. Answer any questions then have the students get in groups. The students are required to find five trees to identify. Have the students draw pictures of the leaves or needles (depending on time of year) using color and label the type of tree and the characteristics associated. The drawings will be collected at the beginning of the next class. Each drawing is worth five points each a total of 25 points for the five drawings.

**Materials Needed:** Tree Identification Key, Plain white paper, Markers/colored pencils.

### Day Three:

**THEME 3: HUMAN/ENVIRONMENT INTERACTION**

The environment means different things to different people, depending on their cultural backgrounds and technological resources. In studying human/environment interaction, geographers look at all the effects—positive and negative—that occur when people interact with their surroundings. Sometimes a human act, such as damming a river to prevent flooding or to provide irrigation, requires consideration of the potential consequences. The construction of Hoover Dam on the Colorado River, for example, changed the natural landscape, but it also created a reservoir that helps provide water and electric power for the arid Southwest. Studying the consequences of human/environment interaction helps people plan and manage the environment responsibly.

Movie Day!! The students will watch *The Greatest Good: A History of Forest Management and the U.S. Forest Service* Part 1 ([http://www.fs.fed.us/greatestgood](http://www.fs.fed.us/greatestgood)). The movie describes in great detail the U.S. Forest Service and their history. This video paints a beautiful picture of human and environment interaction. The students will be given a worksheet (Sheet 4) to complete during the video. There will be questions regarding the video and questions connecting to human/environment interaction. The video will take the whole hour (50 minutes) so some of the questions may be homework for the students. It is good to give another persons point of view to get a point across to students especially if the person is an expert in the area of discussion. The objective is to show how humans should interact with the environment and how they should not. Students will also see what a career, as an employee of the U.S. Forest Service would be like.

**Materials Needed:** Worksheet (Sheet 4), *For the Greatest Good: A History of Forest Management and the U.S. Forest Service* DVD Part 1

### Day Four:

**THEME 4: MOVEMENT**

People interact with other people, places, and things almost every day of their lives. They travel from one place to another; they communicate with each other; and they rely upon products, information, and ideas that come from beyond their immediate environment.

Students should be able to recognize where resources are located, who needs them, and how they are transported over the earth’s surface. The theme of movement helps students understand how they themselves are connected with, and dependent upon, other regions, cultures, and people in the world.
The first five minutes will be spent collecting the worksheets from the video and answering any questions from the video. During this time students should be writing responses to the questions:

- How do trees have a role with the movement of people?
- What do trees do for us in this technologically advanced world we live in with industry and transportation?

Most students understand that we use gasoline and diesel to run our machines, drive our vehicles and fly our planes and that they cause pollution. What a lot of students do not realize is how important our forests are in carbon sequestration and minimizing the amount of CO2 released into the air. For the next fifteen minutes lecture from the PowerPoint presentation given by Maria Janowiak, Northern Institute for Applied Carbon Science at MTU called Role of Forests in Carbon Sequestration. Highlighting the use of biofuels and how trees reduce 10% of US emissions. The rest of the class will be spent using Maria’s worksheet The Carbon in Trees. If the students have not used diameter tapes before a quick demonstration on a tree should be done. The students are to then pick a tree in the schoolyard that they would like to use. Have the students work in pairs so they may help each other out. For the last five minutes discuss what the bonus question is and what it means to each student. The students are to write a half page paper on their thoughts of the last question. The paper will be collected at the beginning of class the next day. The paper is worth twenty points. If the student writes the paper they receive twenty if they do not they receive a zero.

*Materials Needed: Graphing calculator, Carbon worksheet, blank sheets of paper, diameter tape*

**Day Five:**

**THEME 5: REGIONS**

A basic unit of geographic study is the region, an area on the earth’s surface that is defined by certain unifying characteristics. The unifying characteristics may be physical, human, or cultural. In addition to studying the unifying characteristics of a region, geographers study how a region changes over times. Using the theme of regions, geographers divide the world into manageable units for study.

The first five minutes of class will be used to answer any questions from the day before and collect the papers from the carbon worksheet. The students will also answer the question:

- What is a Region and what region do you live in?

The class will discuss the responses for five minutes. For the last lesson the students will read The Forests of Michigan, Chapter 5 The Forests of Early Nineteenth Century Dickman and Leefers. This chapter discusses early European settlers and Natives in the Great Lakes Region. The General Land Office Survey trekked through vast wilderness with no roads mapping out the Great Lakes region, specifically Michigan. Students will learn through reading how the region was two hundred years ago and how surveyors marked or plotted the land with limited tools and technology. For homework the students will draw and label a poster board describing the chapter. Each poster must have colored pictures both drawn and found online, captions explaining the pictures and a short paragraph summarizing the poster and or the chapter. The poster will be due the following day. The rubric for the poster is on Sheet 5.

*Materials Needed: The Forests of Michigan, Chapter 5 The Forests of Early Nineteenth Century Dickman and Leefers, poster board, markers, colored pencils*
**Day Six:**

The beginning of the class is to answer any questions the students have on the unit. Day six is assessment day. The students will present the posters assigned the day before. The final assessment is the poster. How well the poster describes the unit and the reading will determine what the students got out of the five themes in five days. If the students look like the one-day was not enough time to complete the poster an additional day may need to be added. If the students are able to connect the five themes of geography to the specific region discussed such as forests and Michigan the unit was a success. Finally the students will write on the back of the test what they liked the best of the unit, the least and what needs improvement. Improvements can then be made where needed or more emphasis on specific topics.

*Materials Needed: Poster Rubric*

Sheet 1

[http://www.sportsrec.mtu.edu/images/newtrailmap0608_lowerprint.jpg](http://www.sportsrec.mtu.edu/images/newtrailmap0608_lowerprint.jpg)

Sheet 2

**FLAG**

**NUMBER 1**
Field Trip Homework

Directions:
In two or three paragraphs describe the relationship between Location as you defined earlier and the field trip activity. This sheet will be handed in tomorrow when you walk into class. All sentences should be complete sentences!

TOTAL POINTS: 20
Movie Day!!
For the Greatest Good:
A History of Forest Management and the U.S. Forest Service

Directions:
Answer the following questions while you are watching the video. Questions 1-7 are worth **two points** each and the last question is worth **six points**.

1. When was the birth of the U.S. Forest Service?
2. Who was Gifford Pinchot?
3. Who was Aldo Leopold?
4. How is grazing and the U.S. Forest Service related in this video?
5. What was the Denver Lands Convention?
6. What was the idea of “Wise Use” of the land?
7. What was the idea of “Land Ethics”?

Describe briefly in complete sentences in your opinion how we should manage our forests or how the U.S. Forest Service should manage **finish sentence**. (SIX POINTS)
### Poster Rubric

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Use of Class Time</strong></td>
<td>Used time well during each class period. Focused on getting the project done. Never distracted others.</td>
<td>Used time well during each class period. Usually focused on getting the project done and never distracted others.</td>
<td>Used some of the time well during each class period. There was some focus on getting the project done but occasionally distracted others.</td>
<td>Did not use class time to focus on the project OR often distracted others.</td>
</tr>
<tr>
<td><strong>Graphics - Originality</strong></td>
<td>Several of the graphics used on the poster reflect an exceptional degree of student creativity in their creation and/or display.</td>
<td>One or two of the graphics used on the poster reflect student creativity in their creation and/or display.</td>
<td>The graphics are made by the student, but are based on the designs or ideas of others.</td>
<td>No graphics made by the student are included.</td>
</tr>
<tr>
<td><strong>Required Elements</strong></td>
<td>The poster includes all required elements as well as additional information.</td>
<td>All required elements are included on the poster.</td>
<td>All but 1 of the required elements is included on the poster.</td>
<td>Several required elements were missing.</td>
</tr>
<tr>
<td><strong>Content - Accuracy</strong></td>
<td>At least 7 accurate facts are displayed on the poster.</td>
<td>5-6 accurate facts are displayed on the poster.</td>
<td>3-4 accurate facts are displayed on the poster.</td>
<td>Less than 3 accurate facts are displayed on the poster.</td>
</tr>
<tr>
<td><strong>Grammar</strong></td>
<td>There are no grammatical mistakes on the poster.</td>
<td>There is 1 grammatical mistake on the poster.</td>
<td>There are 2 grammatical mistakes on the poster.</td>
<td>There are more than 2 grammatical mistakes on the poster.</td>
</tr>
<tr>
<td><strong>Labels</strong></td>
<td>All items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.</td>
<td>Almost all items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.</td>
<td>Several items of importance on the poster are clearly labeled with labels that can be read from at least 3 ft. away.</td>
<td>Labels are too small to view OR no important items were labeled.</td>
</tr>
</tbody>
</table>

Source: [www.saskschools.ca/curr_content/socst10_05/.../poster_rubric.doc](http://www.saskschools.ca/curr_content/socst10_05/.../poster_rubric.doc)