Lecture Material

This lesson will incorporate one day of inside class work and one day of outdoor activities. To use this lesson you will have to first teach tree identification. There should be some lesson plans on the Penn State database on tree id.

To start the lesson you will need the 4-H book *Trees + Me = Forestry*. On page 36-43 there is an activity dealing with orienteering called "Finding your way"

Make photocopies of this exercise and give to every student. You can use this exercise as a guide as you explain orienteering and topographic maps.

Orienteering- the art of using a map and compass together in order to find your way through an unfamiliar area.

The art of orienteering will help you find your way in unfamiliar woods. Foresters rely on their orienteering skills to help them through the woods when they taking an inventory of the types and numbers of trees in the area. In order to find their way they use a compass and a topographic map.
Compass- a tool that uses the magnetism of the earth to show direction. A compass' needle will point to the magnetic north pole of earth. North is denoted by 0 or 360 degrees, East by 90 degrees, South by 180 degrees, and West by 270 degrees.

Topographic map- a map that uses contour lines to show elevation changes in an area. (have a contour map available to show what contour lines look like)

As you go through the exercise on pages 36-43 make sure you stop and check for understanding of what is being taught.

Teach the students to take a bearing with the compass, which is explained in the exercise. A good activity would be to have the students face a particular wall in the classroom to take a bearing and make sure they all have the same answer. Another way would be to have each student take a bearing on a distant object outside such as a hilltop or a building. Do have students pick an object inside of the classroom to take a bearing on because the closeness of the object will cause the bearings to be off. A student on one side of the classroom will get a different bearing than a student on the other side of the classroom.

Once the students have mastered taking bearings give each one a copy of a topographic map and teach them how to use the map and the compass together (covered in the exercise on page 40). Once the students understand how to use the map and compass you can have them orient the maps for north. Then find where the school would be located on the map. Once the school is located pick a feature on the map such as and intersection or the tallest mountain and have the students give you the bearing they would have to travel in order to reach that point. Make sure the students understand how to use the map and compass together.

Now you want the student to figure out what their pace is. (page 39 of exercise) This is just the distance you travel with one normal walking stride. You can do this my measuring down your hallway in the school. Measure 100 feet and mark the beginning and end points. Then have the students start to walk making sure they start with their right foot. They will count a pace every time their left foot hits the ground. Once they walk the 100 feet and know how many paces it took have them do it 2 more times and average the number then round it off to see what their pace is. They will need to know this when they go outside to do the tree identification part of the exercise.

Now that the students understand how to use the map and compass together and what their pace is they can go orienteering. If time permits and depending on class size you can send the students in small groups to different parts of the school. Have them record the bearings they had to take to get there and the distance traveled. For example: bearing of 230 degrees for 58 feet then a bearing of 310 degrees for 38 feet and a bearing of 40 degrees for 20 feet takes me to the cafeteria. This activity will depend on time and how well behaved your students are.

This concludes the first day for this lesson. Have the students do the activities in the workbook for homework.

For the second days lesson you will need to go to the nearby forest and map out a course, preferably one that takes the students in a giant circle. When you map out the course be sure to write down specific bearings and distances for each leg of the course. Along the course, preferably at each change in bearing, pick a tree that the students can identify and put a card with a number on it. Use a thumbtack to stick the card on the bark or put a stack in the ground in front of the tree; do not nail the card to the tree. As you map out the course be sure to make a key of what each tree is.
The size of the course and the number of trees you have will depend on how long of a class period you have and the proficiency of your students.

When you start the second days class have a sheet with all of the bearings and distances marked on it and a place the students can write what kind of tree they find at each spot. Also make sure the students have a Tree ID key with them. (optional, you can have them id. the trees without keys if you like.) Send students out in small groups of 2 or 3. Make sure each group has a student that understood orienteering very well.
Tell the students that they are supposed to use the bearings and the distances to find trees in the forest. Explain that each tree has a number and that they must find the tree and identify it. Tell the students to pay attention to the forest around them and write down any interesting thing that they may have seen. Also have them write down any questions that they may have during the exercise so that you can answer them in class the next day.

As the students go out on the course follow them through to make sure none of them get lost or have trouble reading the bearings.

For a more advanced class you could use a map instead of giving them the bearings and distances. When you make the course use features on the map to locate the trees. Mark

the map were the trees are and have the students figure out the bearing and the distance by using the map scale.

Follow the exercise up the following day by going over what the trees were at each spot. Make sure all the students understand how to use the map and compass.