Wolf Telemetry

National Science Content Standards:

Unifying Concepts and Processes
- Systems, Order, and Organizations
- Change, Constancy and Measurement

Science as Inquiry
- Abilities necessary to do scientific inquiry
- Understandings about scientific inquiry

Life Science
- Regulation and behavior
- Populations and Ecosystems

Science and Technology
- Understanding about science and technology

Science in Personal and Social Perspective
- Natural hazards

Vocabulary:
Telemetry
Territory
Section=1 square mile, which is 640 acres
Township=36 sections, each one mile square

Introduction:
This is a high interest activity that allows a class to use telemetry data to track real wolves in Superior National Forest in Minnesota. Telemetry data is collected weekly, if possible. Students can select their own wolf, read background information on their wolf, and plot its movement on a map. This is a project that can run all year or for several months as students keep an eye on "their" wolf.
This lesson could be done before or after playing *WolfQuest*.

Objectives:
At the end of this activity, the student will:
1. Use telemetry data to map the location of a wolf over time.
2. Predict and determine the wolf's territory.

Procedures:
1. Go to the International Wolf Center site **"Teaching the World About Wolves - Track Wild Wolves in the Superior National Forest - Introduction"** (address in link). You will want **"First-time trackers! Start here!"** This will take you to **"Track Wild Wolves in Superior National Forest - Telemetry Background Information"** which will give you the information you will need to run a successful study.
2. ****Important**: Order your **Superior National Forest map** or maps ahead of time (address in link). You will see information that tells you how you can order the maps by e-mail, phone or mail. You will need the **"center section"** with township and range markings on it, so do order this map. You will have to decide whether you would like to only track one wolf with your class or have them work in groups (of four, for instance). You can select a "kit" that comes with one map and several activities, one individual map, or sets of 10 maps. If you have several classes, you might consider ordering a map for each group of four students. Assuming you want to use the maps for many years, laminate them, if possible. Also, use sticky dots, sticky note flags, or overhead markers to record the telemetry data (instead of the push pins that are mentioned).

Materials:
- Superior National Forest center section maps (See link or call 1-800-ELY-WOLF)
- Computer access
- Digital projector, if available
- Laminating machine or clear contact paper to preserve maps so you can reuse them many years
- Sticky dots for use on map or overhead markers

Links:
International Wolf Center "Teaching the World About Wolves-Track Wild Wolves in the Superior National Forest -Introduction"
This is where you will start to learn about tracking wolves!
http://www.wolf.org/wolves/experience/telemsearch/vtelem/telem_intro.asp
Superior National Forest Service Map Information
Order maps for this project either by phone or on-line.
http://www.wolf.org/wolves/experience/telemsearch/mapinfo.asp

3. You will definitely want to read through **"Learn from the pack!"** This will explain what to do and will guide you through the project.

4. Preview and plan to show students the photos in **"View photos of the U.S.G.S. wolf survey project"**. This will include aerial photos, plus pictures of wolves being anesthetized and collared. There are other photos at "Field Trip Earth" (link shown below). A class discussion while viewing the photos would probably be best facilitated with the use of a digital projector, but taking the kids into a computer lab would also work.

5. Have the students select a wolf or wolves to track. The directions for the telemetry background information will clearly explain how to do this, but you will need to decide how to present the information to your class. It will show current age, weight, sex and current status of a huge list of wolves in the study (including deceased wolves). If you have access to a computer lab, have the students read through the data table in wolf **"background information"**. If you prefer, print copies of the **"background information"**, so small groups of students can discuss and select a wolf.

6. After your wolf or wolves have been selected, go to **"Start Tracking!"** On the left side of the **"Telemetry Background"** page, you will see **"Search the Database".** It will explain two ways to use the data base. Again, you will need to decide if you will print off the telemetry data (which can be shared between different classes.) or have your class use a computer lab. You may want to print copies of the field names and descriptions (also found under **"Search the Database"**) so the students can get used to the field name abbreviations as they view the telemetry data. Either print and enlarge it, or make copies of the chart for each group.

7. Use the "Township North" and the "Range West" information to plot where individual wolves are located. To learn or refresh yourself on how to read township maps, use **"Graphical Display of the Federal Township and Range System"** (see link). Have the class practice marking a wolf's location, so that each group/individual can do it independently and accurately.

8. Check the online data base weekly or every other week for updates in telemetry data. Your schedule, computer lab availability and/or teaching style will determine if you print off the updated information or allow the students to access it themselves. Have your students try to determine their wolf's territory, and make predictions about where the wolf will most likely be. If you have the students working in groups, have them compare maps to see where other wolves or packs are located.

9. Don't be daunted by this project! Once you try it, you will find that your students will take ownership of "their" wolf and eagerly look to see what it is doing each week!

Field Trip Earth
Other photos of telemetry equipment, thermographic and infrared images, wolf tracks and scat (wolf poop!)
www.fieldtripearth.org/media.xml?division_id=2&category_id=2

Graphical display of the Federal Township and Range System
Great visual and explanation showing townships, range, sections. Excellent place for teachers unfamiliar with township and range system to quickly see how it works!
http://www.outfitters.com/genealogy/land/twprangemap.html

Defenders of Wildlife Wolves Around the World-The Global Status of the Gray Wolf
At the bottom of this report there is a list entitled, "Organizations Working for Wolf Conservation Around the World", listing phone numbers and/or web sites, including various state organizations. Some of the web site addresses are old, but the organizations are still easy to find on the internet once you have their names.
http://www.defenders.org/publications/wolvesarworld.pdf