

## Map Your Name

Downloading GPS "Tracks" to ArcGIS  
(using Garmin Etrex Legend and DNR Garmin)

**Objective:** Students will create, save, download and map "tracks" using GPS and ArcGIS

### Materials Needed:

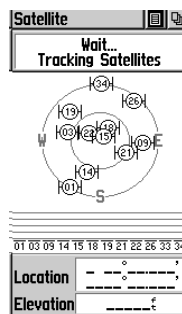
- GPS Unit (Directions are for Garmin Etrex Legend)
- ArcGIS software (see installation instructions if not previously installed)
- DNR Garmin extension (see installation instructions if not previously installed)
- Garmin data cable
- Computer (PC)
- Large open area (playground, sports field, etc.)
- Copies of student directions (one cursive and one block letters for each partnership)
- Digital photograph or other local data shapefile (for extension activities)

**Time Needed:** 1-2 class periods (one for creating and saving tracks, one for downloading and creating maps.)

**Introduction:** Imaging walking through the woods in the winter after a fresh snow. Each step you take leaves a track of your movement through the forest. GPS technology allows you produce, save and map electronic tracks of your movement over any surface. In this activity, students will use a GPS unit to spell their names in block or cursive letters, save the tracks of their names, download tracks to a computer and map the tracks using ArcGIS software.

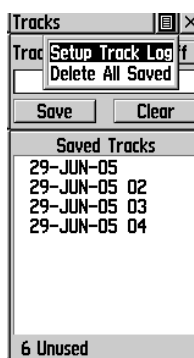
### Procedures:

1. Students will work with a partner, sharing one GPS unit. One student will "spell" his/her name in cursive while the other will "write" his/her initials in block letters. This will be done as students walk on the field. The student is like the tip of the pencil as the GPS unit records the letters or shapes they make on the field as "tracks."
2. In an open space, students will turn on GPS unit and wait as the unit tracks satellites.  
(Image 1)



3. The default settings on the Garmin will record rough shapes because it is set to take track readings at a certain rate. The default setting should be adequate for the first introduction to tracks. If you want more detailed tracks (rounded letters), change the Garmin settings to take track readings more often. This can be done in several ways. First, push the top right button until you see the Main Menu page. Use the clickstick to select “Tracks” and click. On the “Tracks” page, use the clickstick to select the options at the top of the screen and click on “Setup Track Log” (see Image 2). On the “Log Setup” menu, you can change the interval to “More Often” or “Most Often” (see Image 3). The more often the interval, the more detailed the track will be. The other option is to change the “Record Method” from “Auto” to “Time” or “Distance” and change the time or distance interval for recording track points (see Image 4).

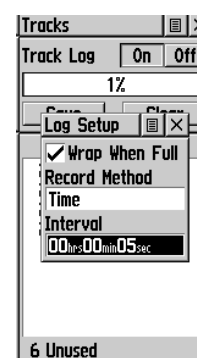
(Image 2)



(Image 3)



(Image 4)



## Extension Activity

1. When students have completed creating and saving the tracks of their names or initials, the saved tracks can be downloaded into ArcGIS as shapefiles and added to other data layers such as an aerial photograph of your area or other local shapefile data like municipal boundary and roads.

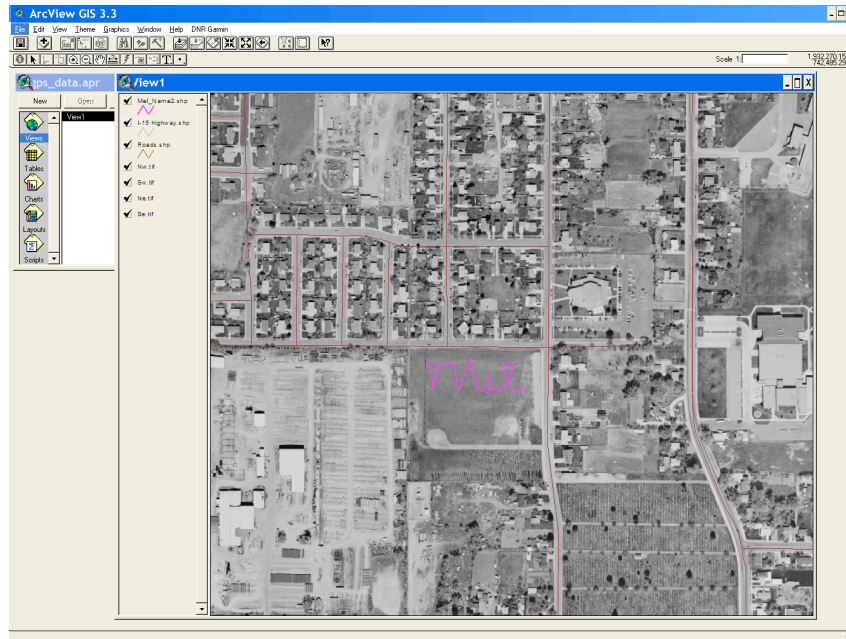
To complete the extension activity, you will need the Garmin Data cord connected to a PC and a program such as DNR Garmin (freeware) installed on the computer. Complete instructions on how to download tracks as shapefiles are described on the “Transferring GPS Points to ArcGIS” sheet.

Make sure that the DNR Garmin program is set to the map datum that you will be using (such as NAD 83 - UTM Zone 12N or NAD 27 - State Plane Utah Central).

2. Students should download the tracks that they saved following the procedures described in “Transferring GPS Points to ArcGIS.” They should save their shapefiles in their own data folders. The cursive track will be one shape file. The block letters can be saved as three separate shapefiles or the three can be downloaded all at the same time into one shapefile.

3. Students should add available themes like the aerial photo or municipal boundaries and roads in ArcGIS. They then add the track shapefile and zoom to the area where the tracks were created.

4. Have students show their mapped names to other students and discuss why some names are more legible than others. This can help reinforce the idea of scale and direction.\*



**\*Note: When a track is on the GPS screen, curves appear quite well, but when the data is saved, it saves data space by straightening out curves. So most “cursive” tracks will not look the same as they did on the screen. You may experiment by downloading “active log” instead of the saved track. The active log seems to preserve the curves better, but it also records all movement.**

**The main point of the activity is for students to learn about the tracking capability of the GPS, scale and data rather than have a perfect letter or name. You may have students track a geometric shape, block arrow or other figure rather than their name.**

**Student One: Spell your name in *Cursive* letters**

A. Move to an open space in the field. Look around from your location and see where you are going to “spell” your name across the field in cursive letters. Imagine that you are the tip of a marker. Everywhere you walk on the field you are writing in invisible ink—but the GPS unit will record the letters and make them visible. If you cannot spell your name from the place where you are at now, move to another place. Make sure the GPS unit is receiving good signals from the satellites.

B. Once you have found a good place to start “writing,” push the top right button on the GPS unit until you see the Main Menu page (see Image 1).

Using the clickstick, move to the Tracks icon and push in on clickstick. On the Tracks page click on “Clear” (see Image 2) You will be asked if you really want to clear the track log. Click “Yes.”

C. Without moving from that spot, push the top right button on the unit 3 times until you see the map page. A triangle will show where you are (see Image 3)

Push on the second button of the left of the GPS unit until the scale at the bottom of the page is at 80 feet.

D. As you move from your spot, the GPS unit will record your movement through the field like a pen writing on a piece of paper. Move on the field to spell your name in cursive. Since you are spelling your name in cursive, your name will be one continuous track. You can watch your progress on the GPS screen, but remember to look up so you will not run into other students. Keep the GPS unit flat and in front of you so the unit can receive clear signals from the satellites.

E. Once your name is complete, stop moving. Push the top right button 3 times to get back to the Main Menu page (see Image 1).

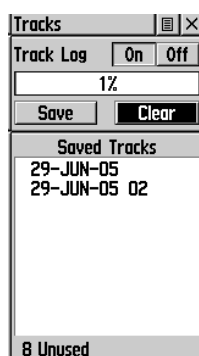
Use the clickstick to “Tracks” and click. Move to and click on “Save” on the Tracks page. You will be asked to “Save Back Through.” Select “Entire Log” (see Image 4) A new screen called “Saved Track” will show the track of your name (see Image 5). Click OK.

You have now saved the track of your name and can download the track to a map later.

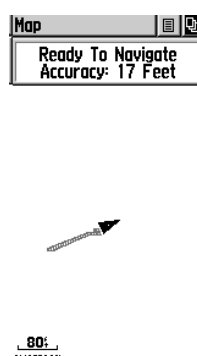
(Image 1)



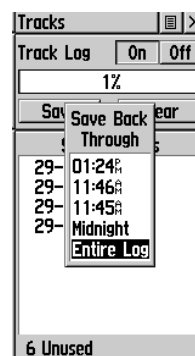
(Image 2)



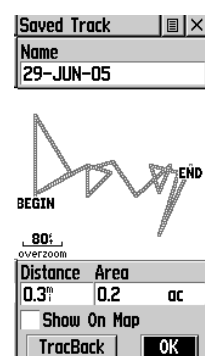
(Image 3)



(Image 4)



(Image 5)



## Student Two: Spell your name in **BLOCK** letters

A. Move to an open space in the field. Look around from your location and see where you are going to “spell” your initials or the first 3 letters of your name on the field in capital letters. Imagine that you are the tip of a marker. Everywhere you walk on the field you are writing in invisible ink—but the GPS unit will record the letters and make them visible. If you cannot spell your name from the place where you are at now, move to another place. Make sure the GPS unit is receiving good signals from the satellites.

B. Once you have found a good place to start “writing,” push the top right button on the GPS unit until you see the Main Menu page (see Image 1).

Using the clickstick, move to the Tracks icon and push in on the clickstick. On the Tracks page click on “Clear” (see Image 2). You will be asked if you really want to clear the track log. Click “Yes.” Even though you have cleared your partner’s track, your partner’s cursive name is still saved under “Saved Tracks.”

C. Without moving from that spot, push the top right button on the unit 3 times until you see the Map page (see Image 3). A triangle will show where you are.

Push on the second left button on the GPS unit until the scale at the bottom of the page is at 80 feet.

D. As you move from your spot, the GPS unit will record your movement through the field like a pen writing on a piece of paper. Move on the field to spell your first initial as a capital letter. Since you are spelling your initials or name in block letters, you will create 3 separate tracks for your letters. You can watch your progress on the GPS screen, but remember to look up so you will not run into other students. Keep the GPS unit flat and in front of you so the unit can receive clear signals from the satellites.

E. Once your first letter is complete, stop moving. Push the top right button 3 times to get back to the Main Menu page (see Image 1).

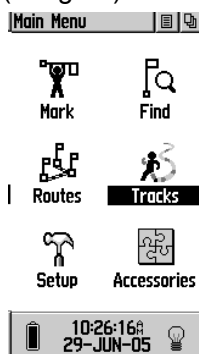
Use the clickstick to “Tracks” and click. Move to and click on “Save” on the Tracks page. You will be asked to “Save Back Through.” Select “Entire Log” (see Image 4). A new page called “Saved Track” will show the track of your letter (see Image 5). Hint: to have the first letter appear on the map while you make the other letters, click “Show on Map.” Click OK. The unit will add a number to the date and save the letter as a new track under “Saved Tracks.”

F. Move to the place you want to start your second letter. *Use the clickstick to clear the track log.* This is like lifting the pen so that the letters are not connected. The GPS unit recorded your track from the first letter to the beginning of the next letter, but you have erased it so it won’t show up on the map.

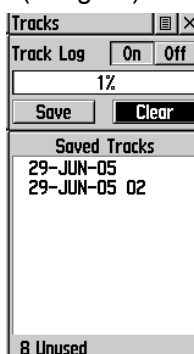
Repeat procedures for the second letter. When you save the next letter track, the unit will add a number to the date and the new track will be listed under “Saved Tracks.”

G. Repeat procedures for the third letter. *Remember to clear the track log each time you move to a new location for a new letter.* After you have saved the track for your last letter, your tracks are stored in the GPS unit so that you can download them to a map later.

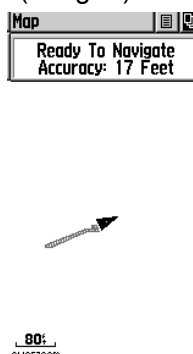
(Image 1)



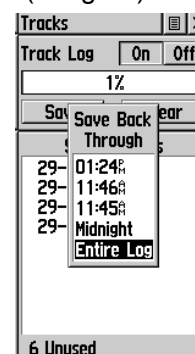
(Image 2)



(Image 3)



(Image 4)



(Image 5)

