

Activity B2 Collecting Data with a GPS Receiver

Note: the procedures described below are for use with the yellow Garmin eTrex GPS receivers (the model supplied in the basic Virginia 4-H GPS Educational Kits). The instructions can easily be altered for use with other GPS receiver models.

Introduction:

GPS receivers are remarkable little computers. When “locked on” to the GPS satellites, they are constantly churning out large amounts of navigational data and other information. In this activity, your students will explore the capabilities of their receivers to generate both stationary (static) data and movement (kinetic) data. They will also learn that all of this data is being recorded automatically and simultaneously. Depending on the receiver model most of this data is saved in some form until intentionally deleted or overwritten.

Time Involved: 50 minutes

Materials Needed: GPS receivers; pens or pencils, data sheets (see below).

Getting Started:

This is a fairly simple 2-part activity that builds upon several of the beginner level GPS activities. The sample data sheet below is useful for even the simplest GPS models. However, you may wish to expand the data sheet items to correspond to the model(s) used by your learners. Prepare enough copies for each individual or team to use in their field exercise. A large open field or playground will be needed.

Also see “*Preparing GPS Receivers for Group Activities*”

Do the Activity:

The first part of this activity is Stationary Data Collection. With their GPS units turned on, each student or team should pick an open location and stop at that spot. Using the data sheet, they should then find and record the requested static-type data that is displayed in their GPS receiver for this location. They also mark this spot as a waypoint for use in the next exercise.

Before going on to the second exercise, your learners should clear (reset) the speed data, trip data, and track log in their GPS receivers.

The Movement Data Collection exercise prompts your learners to observe the kinetic data that is generated by their GPS units during travel and navigation. They should observe and record various types of speed, distance, and directional data that is being calculated and displayed by their receivers.

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STATIONARY DATA: <i>Pick a spot and stop. Find and record the following data from your GPS receiver for this location. Then mark this spot as a waypoint.</i>	
LOCATION COORDINATES:	
ELEVATION:	
SUNSET:	
SUNRISE:	
ACCURACY:	
CURRENT TIME:	
TODAY'S DATE:	
WAYPOINT NAME or NUMBER:	

Important: Before going on to the next exercise, clear (reset) the speed data, trip data, and track log in your GPS receiver.

MOVEMENT DATA: <i>In your GPS receiver, "GoTo" the waypoint you just made. Then move away, traveling in a large circle before returning to your starting point. View the speed, bearing, and heading as you travel. Record observations.</i>	
SPEED:	OBSERVATIONS :
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BEARING TO WAYPOINT:	OBSERVATIONS :

Some questions for your students to ponder:

- Q. What do you have to do to get your GPS unit to collect data?
(Turn it on in an open area where it can “lock-on” to the satellites).
- Q. Does data collection stop when you switch pages in your GPS receiver?
(No, all of data collection continues no matter what page you happen to be viewing. You can switch from page to page without interfering with the on-going processes.)
- Q. Does data collection stop when you lose contact with the GPS satellites?
(Yes, most data collection requires an active connection with the satellites).
- Q. Is the data lost when you turn off your receiver?
(No, the data is saved in your receiver. This is true even when changing batteries. To remove data, you have to intentionally perform the reset or delete process).
- Q. When would *heading* and *bearing* be the same direction?
(When you are traveling directly toward your selected target).

Background Information:

GPS receivers are small computers. When in full contact with the GPS satellites, they are automatically calculating and recording large amounts of stationary (static) data and movement (kinetic) data. The data provided varies by receiver make and model. At the very least, even the basic models provide horizontal position coordinates, elevation/altitude, time of day, date, speed, heading, bearing, time and distance to destination, and an estimate of positional accuracy. More advanced models provide an

array of additional data and refinements. Most of this data is saved in some form until intentionally deleted or overwritten.

*Note: Comments and suggestions regarding this activity and other components of the Virginia 4-H GPS curriculum are appreciated. Please contact Mike Clifford at:
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