

Geocaching/GPS Background & Resources

Terms (from Garmin):

- *Cache*- A hiding place usually holding a treasure.
- *Waypoint*- Location stored in a GPS. It is often entered by taking a reading with the unit at the location, naming it, and then saving it.
- *Latitude*- A position's distance north or south of the equator.
- *Longitude*- A position's distance east or west of the prime meridian.
- *Altitude*- The height of a position in relation to a reference level, often sea level.

What is Geocaching?

- Geocaching is basically a treasure hunt. It is an outdoor activity that uses a hand-held Global Positioning System (GPS) to locate treasure caches (Minnesota DNR).

What is GPS?

- The Global Positioning System (GPS) is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense. GPS was originally for military use, and was first made available for civilians in the 1980s. It works in any weather condition, around the world, 24 hours a day.
- GPS satellites circle the earth twice a day and transmit signal information back to earth. GPS receivers then take this information and use triangulation to calculate the user's exact location.
- A GPS receiver needs to be locked on to the signal of at least three satellites to calculate latitude and longitude as well as to track movement. With four or more satellites, the receiver can determine latitude, longitude and altitude (Garmin).

Programming Prep Work:

- 1) Make your geocaches. It's probably best to make at least the same number as the number of GPS units that you have. You can use anything, really, for a cache: test tubes, empty bottles, small boxes, etc. You can make them as big or as small as you would like (obviously the smaller ones will be harder to find). Also consider putting some sort of identifier on them to distinguish them from random garbage. Leave one out as example to show the participants before they begin.

- 2) Decide what you want to put in the caches. It could be small prizes or a question the participants have to answer.
- 3) Experiment with the units so you have some idea of how they work. Also, check the batteries on all units.

Set up Beforehand:

- 1) Hide all caches and setup a waypoint for each cache using a Master GPS unit. Choose your hiding locations carefully and consider the ages of participants. Assign each waypoint a unique number.
- 2) Transfer all waypoints from Master GPS unit to computer GPS system. (EasyGPS is free software that is recommended for this purpose. Visit <http://www.easygps.com/> for more information.) Note that units must be turned on to transfer.
 - a. 4-H has created some very helpful videos to help you with this process: <http://screencast.com/t/nnzDfoafy> shows how to receive waypoints from the Master GPS to the computer, using EasyGPS. Hook up the Master GPS to the computer and follow the video.
 - b. <http://screencast.com/t/zWDhIT2zyO> shows how to send the GPS coordinates from the computer (with EasyGPS) to each GPS unit.
- 3) Repeat with each GPS unit so they all have the waypoints (4-H).

Basic Rules for Participants:

- 1) Be careful! Hold the unit in both hands.
- 2) After opening the cache, put it back EXACTLY as you found it for the next person.
- 3) Keep moving to keep the GPS unit accurate.

Sources:

- EasyGPS: <http://www.easygps.com/>
- Minnesota Department of Natural Resources: http://www.dnr.state.mn.us/state_parks/geocaching/whatisit.html
- Garmin: www8.garmin.com/aboutGPS/
- Geocaching: www.geocaching.com