

# GPS & GeoCaching

## Suggested Number of Volunteers: 2-4

## Materials in Activity Tub:

- Hand-held GPS Units (4)
- Caches (4)

## Materials Provided by the Group:

- none

## Objectives

Students will:

1. Learn about GPS and how it works.
2. Learn how GPS can be used to track animals or wildlife.
3. Learn about GeoCaching - what it is, how it works, and GeoCaching opportunities in Nebraska.

## Background:

GPS is a means of determining a point on the earth's surface using a hand-held device (or one mounted in your car) and satellites orbiting the earth.

## GPS and How it Works:

- GPS stands for Global Positioning System
- GPS is a way to use latitude and longitude to mark a point on the earth's surface.
- GPS works by using satellites orbiting the earth. The hand-held GPS unit (or the one in your car) "lock" onto satellites. The GPS Unit must lock onto at least 3 satellites to be accurate. These satellites and the GPS units beam signals back and forth to each other. Three satellites "triangulate" to determine where the GPS unit is in relation to all three satellites. This is done by measuring the time the signal from the GPS unit takes to get to the satellite. If a satellite is farther away, the signal will take longer to get there. Or, if the satellite is closer, the signal will reach it faster.
- When you move, the GPS unit is now farther from one satellite and closer to another... you have moved your latitude and longitude position which is then displayed on the GPS screen.
- You can mark a point using the GPS unit, then return to that point later using the GPS to guide you.

## GeoCaching and How it Works:

- GeoCaching is a game where an object (cache) is hidden, then using a GPS unit, another person or group tries to find the cache.

## Procedure:

*Before the Activity*

**The Preparation for this activity takes approx. 30-45 minutes!**

1. Turn on GPS Units. Wait for them to find the satellites. This may take several minutes. The GPS Unit needs to find at least 3 satellites to be accurate, so be patient!
2. Walk some distance from the starting point/area and hide one cache. It is best to hide the caches in some brush, tall grasses, or even in a tree. Be sure the cache is not too well hidden as the GPS unit will get you within 10 feet when searching, but not to the *exact* location. When participants have gotten within about 10 feet

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of the cache, they will need to start looking visually for the cache. If the cache is too well hidden, they will not find it.

3. Once you have hidden the first cache, stand next to it and prompt the GPS unit to mark this “waypoint” (complete directions can be found in the GPS unit direction manual).

4. After the first “waypoint” has been marked, walk some distance from the first cache and hide the second cache. Again, prompt the GPS unit to mark this “waypoint.”

5. Continue hiding and marking the caches.

## *The Activity*

1. Welcome participants to the station. Ask if they have ever heard of GPS? If they have, ask them what it is and how it works. If they haven't explain what GPS is and how it works.

2. Explain to participants that they will be using GPS units to find caches that have been hidden in nature. The caches are one of four random items such as a stuffed toy - things that are not normally found in nature.

3. Provide each group of 2-5 participants with a GPS unit (with the cache(s) already marked). Show them how to use the GPS unit.

### Remind participants:

- The GPS unit works best when you continue moving. The unit works by sending and receiving signals from satellites and the information is most accurate when you continue moving.
- The GPS units are only so accurate... the more satellites the GPS unit is “locked” onto, the more accurate it is. The unit will tell you how accurate it is at the current time. Be mindful that the GPS unit may say the cache is within 5 feet, but that does not take into account the +/-

feet of accuracy... this means the cache may actually be 10 feet away!

- Be patient and have fun!

4. Send the participants on their way. Alternatively, if you have enough volunteers, it is helpful to send a volunteer with each group. The volunteer can encourage participants and help guide them when using the GPS unit.

If Participants are interested in learning where other caches can be found, instruct them to visit:

- Nebraska Game & Parks Commission: Geocaching at State Park Areas  
[outdoornebraska.ne.gov/parks/geocaching.asp](http://outdoornebraska.ne.gov/parks/geocaching.asp)

- Geocaching.com  
[www.geocaching.com](http://www.geocaching.com)

- Wyo-Neb Area Geocachers  
[www.wnag.net](http://www.wnag.net)

If participants are interested in getting a GPS unit, you can let them know that the units they are using for this activity are approximately \$100. GPS units generally cost between \$100 and \$600.

GPS units can be purchased at many sporting goods stores, outdoor stores (Sheels, Bass Pro, etc.).