

Advanced Geocache Honor Answers

1. **Have Basic Geocache Honor**
2. **Briefly discuss the origin of the global positioning satellites. How many were there originally? And what is their history – when and how did they get there? By whom?**

http://www.pbs.org/newshour/bb/transportation/jan-june98/gps_5-21.html

Here's how it worked: 24 satellites--launched and maintained by the military--are in continuous orbit 12,000 miles above the earth. They send down signals, and --because of atomic clocks on board. They keep extremely accurate time. Using geometry, the satellite signals can pinpoint exactly where the individual is. Stanford Professor Bradford Parkinson, a retired Air Force officer, is considered the "father" of GPS.

Originally there were 24 GPS satellites (21 active, 3 spare) in orbit at 10,600 miles above the earth. The satellites were spaced so that from any point on earth, four satellites will be above the horizon. Each satellite contains a computer, an atomic clock, and a radio. With an understanding of its own orbit and the clock, the satellite continually broadcasts its changing position and time. On the ground, any GPS receiver contains a computer that "triangulates" its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position - longitude and latitude - to, for most receivers, within a few meters

3. **Define latitude, longitude. What is meant by degrees, minutes, seconds?**

<http://www.geocaching.com/about/glossary.aspx>

(**Latitude** is the angular distance north or south from the earth's equator measured through 90 degrees. **Longitude** is the angular distance measured on a great circle of reference from the intersection of the adopted zero meridian with the reference circle to the similar intersection of the meridian passing through the object.)

Latitude is written in degrees, minutes, seconds north or south

Longitude is written in degrees, minutes, seconds east or west

The most popular coordinate system is the one that shows standard Degrees/Minutes/Seconds coordinates. Remember that there are 360 degrees, but you can only go up to 90 degrees north or south latitude, or just short of 180 degrees east or west longitude. At the equator a degree of longitude is over 69 miles wide (111 km), so smaller divisions are required for depicting points accurately. The system in use is best remembered like what is used on a clock. Think of a degree as an hour. Each degree is broken up into 60 minutes, each minute is broken up into 60 seconds. A minute is still over a mile wide (1.6 km) at the equator. A second, at .0192 miles, is getting more manageable, but that is still over 100 feet (30 meters). Longitude lines get closer together until they reach the poles, but latitude lines stay the same distance apart all the way to the pole. The distances between latitude lines are easier, always those same figures given above for the equator longitude data. For more accuracy, a degree = 69.1722 miles

(111.2981 km), a minute = 1.1528 miles (1.8549 km), a second = 101.45 feet (30.9 meters).

4. **Complete two or more of the following:**
 - a. **Establish and maintain a new geocache in your area for at least 6-months.**
 - b. **Send out and follow a TB (travel bug) for 6 months.**
 - c. **Find 2 travel bugs and follow for 6 months**
 - d. **Participate in a geocache meeting or event in your area (attend).**
5. **What are the laws/rules/guidelines for placing caches in the following locations?**

<http://www.ggaonline.org/gadodont.html>

 - a. State Parks (*Every state is different and sometimes there is a difference between counties. You will need to ask permission to place any traditional physical cache. Also some state parks that allow traditional caches limit the number at any given time*)
 - b. National Park Service (*traditional physical caches not allowed*)
 - c. Roads and Railroad Right-of-Ways (*Never place a cache within 150 feet of any railroad line. Never place a cache in a roadway right-of-way such as inside of cloverleaf off ramps, etc. You must be able to legally park to hunt for any cache.*)
 - d. Placing caches while traveling (*Do not place traditional physical caches while on vacation or business unless you have contacted a cacher in the area and have an agreement with them that they will look after your cache for you. If you have a problem with the cache you have no way to check it in a timely manner and it will probably be archived if there are issues. Keep your hidden caches close by.*)
 - e. Wilderness Areas in National Forest Areas (*Geocaches are not allowed in Wilderness Areas in the National Forest Areas.*)
 - f. USDA Forest Service (does allow caches in the general National Forest).
6. **Find and record at least 18 geocaches; include:**
 - a. **One Traditional cache with 3-star difficulty**
 - b. **One Multi-level**
 - c. **One virtual**
 - d. **One micro**