GPS 101: Globally Positioning Students in the 21st Century

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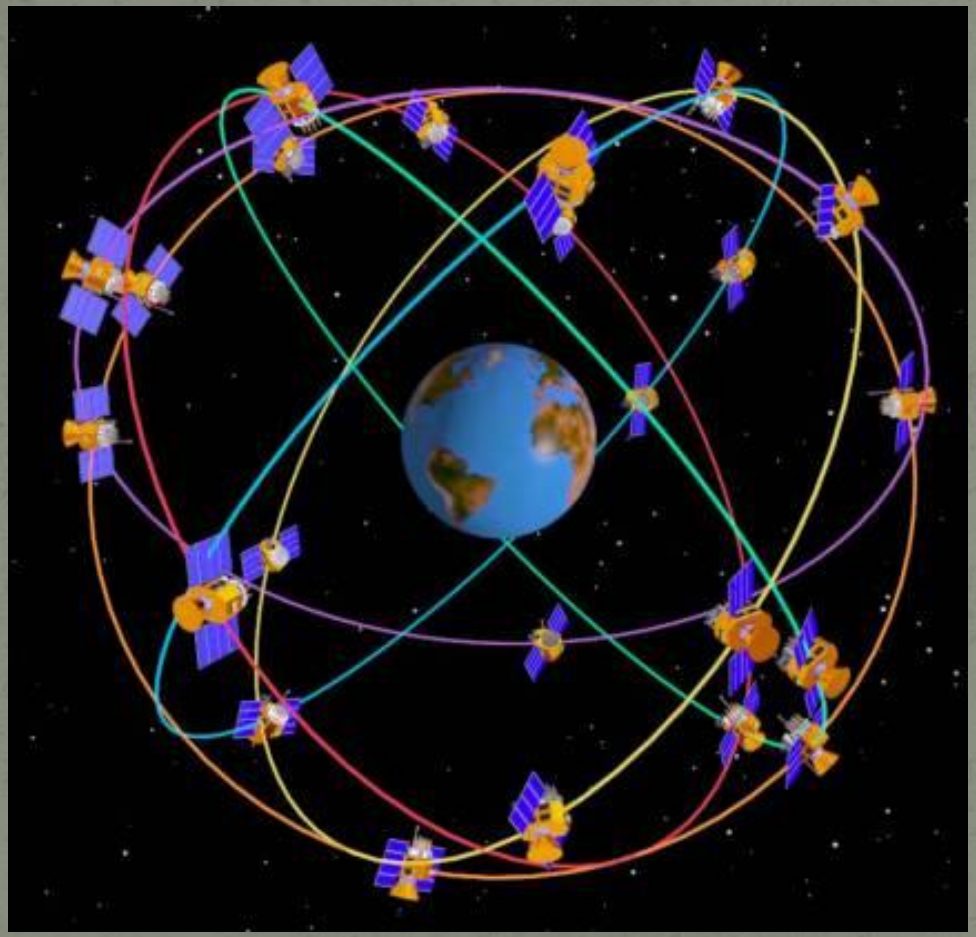
What is GPS?

- Global Positioning System
- Satellite based radio navigation system
- Conceptualized by the Department of Defense in the 1970s
- First military satellites launched in 1978
- Originally used to accurately position ballistic missile submarines before launch

What is GPS?



What is GPS?

- 24 NAVSTAR Satellites orbiting the earth in 6 different orbits
- Five ground stations align satellites
- NAVSTAR satellites orbit at 10,900 miles
- Satellites are 2 tons and over 15 feet long
- Orbit the earth in 12hours

Transition into civilian use

- Satellite system information declassified by President Ronald Reagan in 1983.
- On May 1, 2000, the GPS signal degradation called Select Availability (SA) was removed, thanks to a law signed by President Bill Clinton.
- The change allowed GPS units owned by civilians to now be accurate to within 6 feet.
- In times of National emergency, the United States reserves the right to “dither” GPS radio signals.

What is “Geocaching?”

An Easter-egg hunt?

A high-tech treasure hunt?

Geocache Beginnings

- On May 3rd 2000, the first cache was hidden in Oregon.
- Mike Teague, the first to find it, built a web page to document the hiding, finding , and logging of 'caches'.
- Jeremy Irish, the current operator of the Geocaching.com, expanded the idea and named it *'geocaching'*.

What is Geocaching?

- A geocache is placed at an interesting location either in the woods (hard to find) or in an urban location
- The containers are usually well hidden but should never be buried.

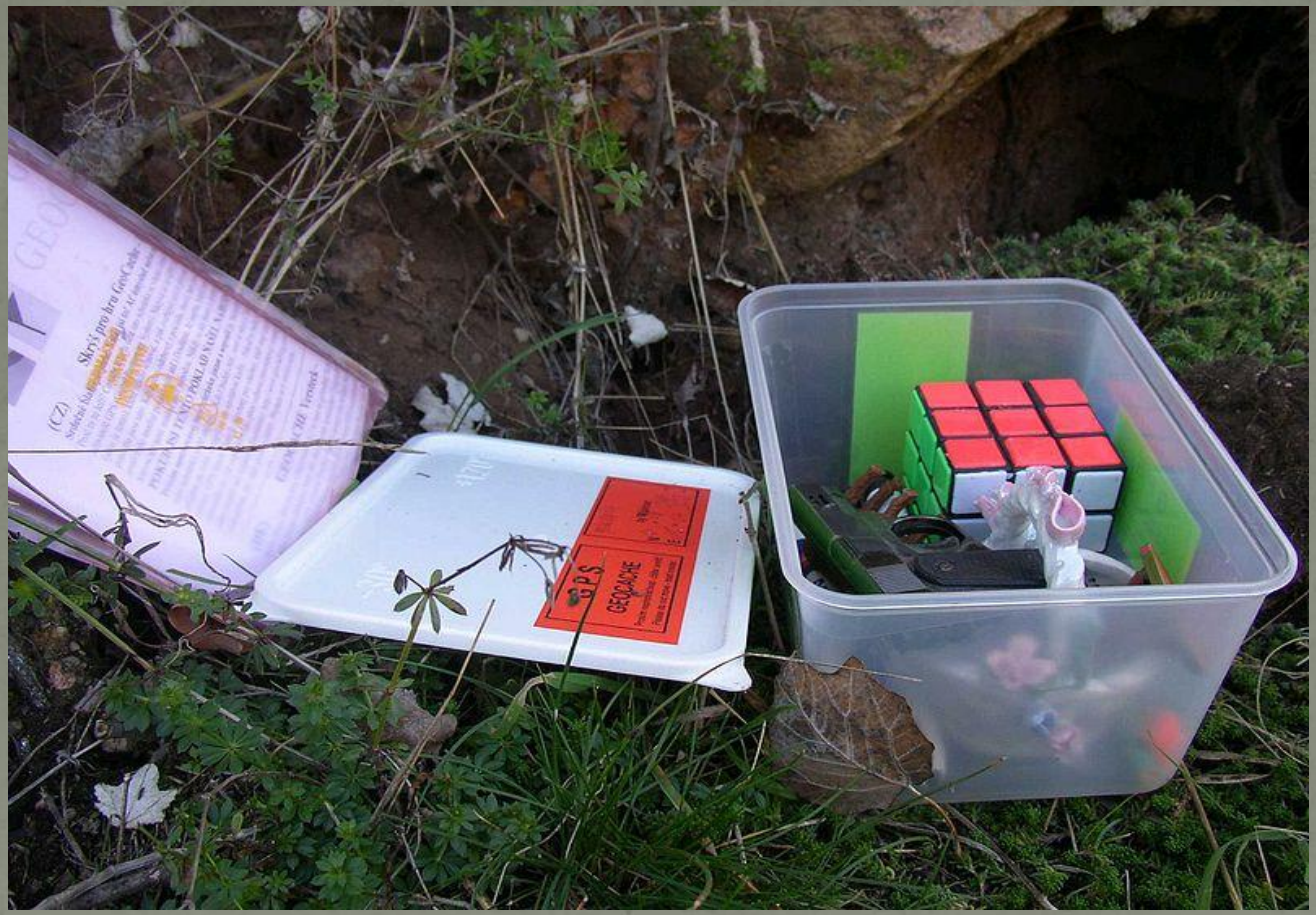
What is Geocaching?

- “Geo”=earth
- “cache”=hidden
- Containers of various sizes hidden in various locations
- Latitude and Longitude coordinates “marked” by GPSr
- Coordinates uploaded to a computer management system or database

What is Geocaching?

The Process

What are we looking for?


GEOCACHE

What is a GPSr?

The Basics-Before You Go

- Learn how to operate your device and bring extra batteries.
- Select a cache with terrain and difficulty ratings that match your goals (1/1 to 5/5).
- Read the geocache description and don't forget the hints.
- Pack smart; you may need water, food and extra clothing.
- Invite some friends!
- Let others know where you are going.

The Basics-On Your Way

- When venturing into nature, mark your car or trailhead for a happy return.
- Rely on your eyes rather than your device when in close proximity.
- The geocache is never buried, but it is often cleverly camouflaged.
- Respect the environment; practice Cache In Trash Out.

What are the Rules?

The Basics-After the Find

- Sign the cache logbook.
- Leave the cache as you found it.
- Share your geocaching stories, photos, etc, at geocaching.com.

GEOCACHING.COM

The Rules

- If you take something from the cache, leave something of equal or greater value.
- Note your find in the cache logbook.
- Log your experience at geocaching.com.
- When setting up a cache:
  - The cache should never be buried or placed in a location that might cause unnecessary concern.
  - No food, explosives, weapons, drugs, or alcohol
  - Respect local laws and obey signs.

Terminology

- Containers
  - Bison tube
  - Micro Cache
  - Ammo can
- Muggles
- FTF
- DNF
- Geocoin/ Travel bug
- GZ
- LPC

Uses for GPS receivers

Geocaching.com

Geocaching - The Official Global GPS Cache Hunt Site

You are logged in as pughmtcs. Log out

GEOCACHING.COM

HELLO PUGHMTCS!

Basic Member
Since: 09/05/2008

Caches Found: 18
Caches Hidden:

Upgrade your Membership
Your Profile | Log out

- GETTING STARTED
- HIDE & SEEK A CACHE
- FIND A BENCHMARK
- TRACKABLES
- YOUR PROFILE
- RESOURCES
- FORUMS
- BLOG
- GPS REVIEWS
- SHOP FOR GEAR

WELCOME TO GEOCACHING

Geocaching is a high-tech treasure hunting game played throughout the world by adventure seekers equipped with GPS devices. The basic idea

SEARCH FOR GEOCACHES

There are **1,305,349** active geocaches around the world. Enter your postal code or address and click "Search" to explore the geocaches near you.

N 35° 53.994 W 080° C Search

Determine My Location

Alternatively, you may search by GC Code, if you know the code of a specific geocache.

GC Search

Advanced Search

Mini-Courses

Mock-Find

Staff Buy-In

- UNC-G
- Core MTAC Expansion
- Web Conference
- Mini-Courses

GPS in the Classroom

- Historical Geocache
- Integration of North Carolina history/ 8th grade and Thomasville, North Carolina
- Pre-teach history
- Upload coordinates
- Find caches
- Activity Sheet

GPS in the Classroom

- Social Studies/Mathematics/ Black History
  - Solution to math problems equal important historical dates
  - The solutions/dates equal named waypoints
  - Each cache contains an important fact concerning a historical event
  - Facts learned used to create a historical timeline celebrating Black History

GPS in the Classroom

- The Thirteenth Amendment to the Constitution officially ended slavery throughout the nation.
- 3143-(213x6)=1865
- 1865 becomes the answer for a waypoint location

Classroom Extensions

- Mathematics
  - "Trace shapes" using tracks feature and calculate vertices
- Science
  - Earthcaching—using GPS coordinates to locate and identify geological formations, plant life, and scientific phenomena
- Language Arts
  - Use geocaching field experience as an invention source in classroom writing—process essays , descriptive essays

Earthcache Example

- Use GPS to learn about local plant populations with a focus on native species versus invasive species.
  - Background information on GPS and geocaching.
  - Locate plants to study and pre-load coordinates into the GPSr.
  - Students create local maps of the locations and compare these maps to state scientific maps that compare the two types.
  - Students can create a project that traces the origin of the invasive plants and compares the climate and ecology of the origin region to that of the local region.

Classroom Extensions

- Social Studies
  - Use waypoints to investigate areas of historical interest
- Physical Education
  - Use geocaching to promote outdoor physical activity (level of stress can be manipulated based on terrain)
- Multicultural Education
  - Use of geocoins and travelbugs can be used to explore diverse cultures

Collaboration!

GPS Resources

- www.geocaching.com
  - Official website for listing and searching for geocaching worldwide
- www.ncwiseowl/it/ncgeocache/default.htm
  - Lesson plans and ideas for using geocaching in the classroom
- GPS and Geocaching in Education,
  - Burt Lo / ISTE