# Learning About GPS.!

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# What is GPS?

- GPS stands for "Global Positioning Systems."

- It was mainly designed for military use.

- In 2000 it became available for civilian use.

# How Does GPS Work??



- There are 24 satellites orbiting the earth approximately 12,000 miles above its surface.

- Our location is determined by trilateration of satellites to give our global address.

- 4+ satellites are needed to find latitude, longitude, and altitude.

# GPS has many uses!

- Transportation – navigation in cars, trucks, boats, airplanes, etc.

- Emergency Services - police cars, fire trucks, and ambulances to help find accidents and residences.

- Utilities Companies – to map and plan gas and electric lines.

# More uses…

- Agriculture – to test soil for seeding.

- Archeologists – to mark dig sites and specific artifacts within an archeological field.

- Genealogists – mark gravesites and cemetery locations.

- Recreation - Sports - hunting, fishing, camping, hiking, etc.

- Cartographers – map making…and many more uses!!!

# GPS in a classroom???

- GPS is used daily by many professionals.

- Why not let our students have the opportunity to use this technology, also??

- This is where "geocaching" comes in!

# What is Geocaching?

- A new hi-tech "treasure hunt"!

- Geo means "earth"
- Cache means "hide"
- Geocaching is basically hiding something in the earth.

# What is Geocaching?

- The GPS unit makes it "hi-tech"!

- Given a grid system of lat/long or UTM, one finds the treasure – or "cache"!

# Geocaching Acronyms

Here are some common acronymns that are used:

- CITO – Cache in, trash out.  Take a plastic bag along with you and pick up trash.
- FTF – First to find
- TFTC – Thanks for the cache!
- TNLN – Took nothing, left nothing

# More Geocache Terms…

- GPSr – GPS receiver

- Waypoints – coordinates that represent a location on the earth's surface.

- Geomuggle – a person who is <u>not</u> a geocacher, finds a cache and doesn't know what to do with it.

# Satellite Reception?

- GPS units usually have "visibility" through the clouds.



- Photo courtesy of Mrs. Sepp – Stratford, CT beach

# Satellite reception?



- GPS units may <u>not</u> get any satellite reception if landforms get in the way.

- http://photo.itc.nps.gov/storage/images/arch/arch-Full.00002.html

# Satellite reception?



- **GPS units may <u>not</u> get any satellite reception if you are in a dense forest.**

- http://photo.itc.nps.gov/storage/images/blri/blri-Thumb.00001.html

# Satellite Reception in Urban Areas??



- GPS doesn't work well between tall buildings.

- You need to look for open areas to make the GPS unit work!

- Photo Courtesy of Mrs. Sepp – Manhattan, NY

# Geocaching Rules!

There are some general rules:

- If you take something out of the cache, you must replace it with another item.

- Sign the logbook (name, date).

- **<u>ALWAYS</u>** put the cache back **<u>EXACTLY</u>** where you got it.

# What is a Geocache Container? and what goes into it??

- As a general rule, you will have a waterproof (or snowproof) container.

- Plastic containers (like Tupperware), ammo boxes, plastic PVC pipes are popular.

- Notebook and pen/pencil.

- Make sure you label your cache so someone doesn't think it is trash and toss it away.

- Also, you might enclose a note so the finder knows about your cache.
  (Sample letter is here:  http://www.geocaching.com/about/hiding.aspx)

# No Nos in Geocaching!

Do <u>NOT</u> put any of these items in a cache:

- Explosives
- Ammo
- Knives
- Drugs
- Alcohol

**Use Common Sense - Nothing Dangerous!**

# More  No Nos in Geocaching

- NO FOOD!   Wildlife can find it or it can go bad. Yuk!

- Respect any local laws!

- **Always** get permission if on private property!

- Contact the Management Agency to follow the rules for Public Lands.   Caches are not allowed in the US National Parks in order to protect these locations.

# Geocaching Ideas for your classroom

- You can put a logbook and a special item (paper clips, stickers, etc.) for every student in a geocache.  When the student brings the item back to the room, s/he receives a "treat."

- You can put a sealed envelope (with an assignment) in each cache. Students bring it back to the class unopened and figure out the answers once in class.

# More Geocaching Ideas

- Make a multi-cache. Each cache has a clue to the next cache. The last cache has the logbook and special items.

- Virtual cache doesn't have a physical container. It may be a historical plaque or monument. You will answer a question about the item to show you were there. Sometimes a picture is taken with the cache.

# And…..More Geocaching Ideas!

- Have your students create a "geocache" at your school or location nearby.  See if their classmates can find the geocache.

- Join www.geocaching.com and create a "geocache" where it is tracked online.  You can go to the computer lab and check who has logged into your cache.  (It can also travel around the world.)

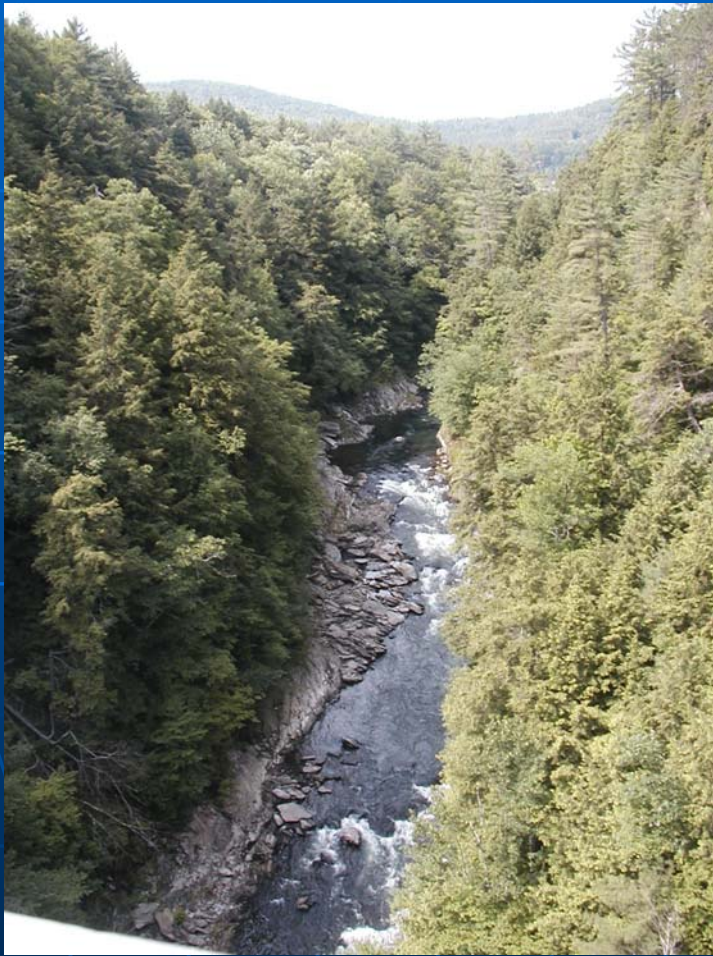- The ideas are endless!

# Degree of Confluence Project



The goal of the project is to visit each of the latitude and longitude integer degree intersections in the world, and to take pictures at each location. The pictures, and stories about the visits, will then be posted here.

http://www.confluence.org

# Earthcaching



- Virtual geocaching with an educational focus around a unique geoscience feature.

- Go to www.earthcache.org to learn about these locations!

- Photo:  Courtesy of Mrs. Sepp
  Taken in Massachusetts

# Other Educational Uses of GPS!

- GIS-GPS Community 4H Projects
  http://www.4-h.org/ and http://www.esri.com/industries/k-12/4-h/projects.html

- Join Yahoo group for educators:   nygps @yahoogroups.com    (Has over 900 members who are interested in GPS and share activities, etc. )

# Explaining GPS!

# Finding Satellites…

# Name that Waypoint!

# GPS Fun!

# Learning to Use GPS!
## Practicing in the classroom..

# Learning to Use GPS!

# Learning to Use GPS!

*…finding answers with your unit!*

# Practicing Geocaching!

# Unusual Waypoint!
*(only kidding)*

# Practicing Geocaching!

- Where it that cache??

*Found It!!*

# Now you know more about GPS!

# Have fun using this geo-technology with your class!