

Geocaching Merit Badge

Scouts BSA



Geocaching

"A sport where you use a multi billion dollar satellite system to find rubbermaid containers and ammo boxes in the middle of the woods" - Anon.





Geocaching

Worldwide game of hiding and seeking "treasure".

www.geocaching.com

- Using technology to enjoy nature and community
- Using GPS and map/compass skills
- Learning about latitude and longitude
- Seeking hidden containers
- Adventuring/Questing with friends and family
- Fun puzzles
- Can be done while social distancing

History of Geocaching

Global Positioning System, GPS, was created by the US Dept of Defense

 May 1, 2000, gov't announced the removal of "Selective Availability" so civilians could find locations with 10x more accuracy

- May 3, 2000, Dave Ulmer hid a bucket of swag in the woods outside of Portland,
 Oregon and posted the coordinates in an internet post.
- He called it the "Great American GPS Stash Hunt".
- Rules: "Take some stuff, leave some stuff".

History of Geocaching

- Matt Stum coined the term "geocaching". He was the first to find Ulmer's stash.
- Jeremy Irish created www.geocaching.com

Today, there are more than one million caches hidden in over 200 countries.



Types of Geocache





Multi



Mystery



Letterbox Hybrid



Earth



Wherigo



Event



Mega-Event







Virtual



Webcam



GPS Adventures Maze Exhibit



Prospect A.P.E



Groundspeak Headquarters



Benchmark Hunting



Waymarking



Lab



Sizes of Geocache

- Nano
 - < 10 milliliters
- Micro (XS)
 - < 100 milliliters: ex. film canister with tiny log sheet</p>
- Small (S)
 - o 100 milliliters to 1 liter: approx size of an apple
- Medium (M)
 - o 1 to 20 liters: ex. showbox or ammo can
- Large (L)
 - >20 liters: ex. buckets or bins or railroad freight cars
- Other
 - o doesn't fit other categories: ex. magnetic sheet

Terrain and Difficulty

Terrain

- Describes the land features and how hard the cache is to get to.
- Rating 1 can be traversed in a wheelchair, flat and easy and not too far
- Rating 5 means you probably should NOT try it because it will require special equipment, like scuba gear or mountaineer ropes
- Paved trail vs. Steep terrain, water, cliffs

Difficulty

- Ranking system to describe how hard the cache is to find
- Rank 1 easiest to find
- Rank 5 hardest to find, exceptionally well hidden
- o 50 gallon painted garbage can vs nano in the top limb a tall pine tree

Attributes

- What to expect at the location
 - The icons on a cache detail to provide helpful information for those who want to find specific types of cashes
 - Represent unique characteristics or warnings: kid-friendly, available 24 hours/day, need special equipment, dog-friendly, parking available, stealth required, watch out for insects or snakes



Learning the Language

Cache

- Short for Geocache
- Geo: for Earth, to describe the global nature of the activity and use of geography
- Cache: referring to a hiding place for temporary storage (ex. Pirates and Goldminers) and a reference to memory cache in computer storage as a nod toward the use of technology

Waypoint

- > Physical location on Earth
- Landmark, or destination, or point along the route
- Defined by a set of coordinates that include latitude/longitude or UTM coordinates, and sometimes altitude

Accuracy

- No civilian GPS receiver has perfect accuracy (freedom from error)
- May be low due to interference from trees, power lines, buildings, cliffs, valleys, or other landscape features that affect the reception of the satellite signal

Learning the Language

Log

- Logbook, notebook, or logsheet in a cache
- Information from the cache owner, provides a place for geocachers to write their name and date they visited. May be space to leave notes or comments
- Virtual logbook may be available online

Trackable

- Anything with a tracking number or other unique identifier that can be followed as the item travels from cache to cache
- <u>www.wheresgeorge.com</u> tracks currency
- o <u>www.sigitem.com</u> tracks personal signature item
- o <u>www.pathtags.com</u> tracks small metal coins
- Geocoins and Travel Bugs are the most tracked items on <u>www.geocaching.com</u>









- Hypothermia
- Heat Reactions: Heat Exhaustion, Heat Stroke, Sunburn, Dehydration
- Disorientation
- Rough Terrain
- Poisonous Plants
- Insects: Mosquitos, Ticks, Stinging Insects
- Snakes









Cuts, Scrapes

- Prevention: Be mindful of surroundings
- Treatment: Wash with soap and water, then apply iodine. May apply antibiotic ointment, if needed

Blisters

- Prevention: Wear good/supportive shoes that are broken in
- Treatment: Moleskin and gel pads

Sprains/Strains

- Prevention: Watch where you step
- Treatment: Leave boot on and reinforce your ankle by wrapping it with a triangle bandage. Go to doctor, if needed

Mosquito Bites

- Prevention: Apply DEET to exposed skin and clothing. Wear long pants and long sleeves
- Treatment: DO NOT SCRATCH. Wash bites with soap and water, apply Cutters Bite MD





Snakebite

- Prevention: Be mindful of surroundings. Assume every snake is venomous until proven otherwise
- o Treatment:
 - Nonvenomous: Wash with soap and water, then apply iodine
 - Venomous: Go to the hospital now. Calm the person, hold the limb still and lower than the heart, remove any jewelry in case of swelling

Tick Bites

- Prevention: Wear long sleeve shirts and pants. Button collar and tuck pant legs into shoes.
 Inspect daily
- Treatment: Remove tick with tweezers, grasping near your skin, gently pull. Wash area and your hands with soap and water







- Prevention: Be mindful, avoid hives/nests, insect repellant
- Treatment: Scrape stinger away with edge of knife, apply Cutters or a pinch of tobacco

Exposure to Poisonous Plants

- Prevention: Know which plants to avoid (research), wear long sleeve shirts and pants.
- Treatment: Wash hands and affected areas with soap and water, then wipe with rubbing alcohol, then a soothing skin treatment, calamine lotion. Change clothes and keep them separate from your other clothes

Hypothermia

- Prevention: Dress warmly, drink enough water
- Treatment: Offer warm drink, warm shelter, cover head, zip into dry sleeping bag, position warm water bottles in armpits and groin



Heat Exhaustion

- Prevention: Wear appropriate clothing, drink enough water, take breaks
- Treatment: Give cool water, wet clothing, fan, take a break in shade

Heat Stroke

- o Prevention: Wear appropriate clothing, drink enough water, take breaks
- Treatment: Call 911, Give cool water, douse clothing with cool water, pack ice packs into armpits/groin, fan, place in shade

Sunburn

- o Prevention: Wear hat, appropriate clothing, use sunscreen (minimum SPF15) and reapply often
- Treatment: Aloe Vera and time

Dehydration

- Prevention: Dress appropriately, drink enough water to keep urine light and clear
- Treatment: DRINK WATER



• Electronic navigation network that uses satellite signals to determine specific places on or near Earth's surface 24/7. Works in all weather. No subscription or set up fee

Satellites

- 24 orbit the Earth at 8,700 mph
- Transmit position, orbit, location, altitude

Control

- Satellites are tracked by the US Air Force Monitoring Stations
- Ground stations send updates to the satellites

Receiver

- Uses the time it receives the signal from the satellite to determine location and altitude
- Needs data from a minimum of 4 satellites
- 3D quadrilateration: process of determining location based on 4 satellites
- More satellites means more accuracy

Receiver

- Tells you where to go
- Tracks where you have been
- Stores maps: Topography, Trails, Streets
- Stores coordinates (waypoints, points of interest)
- Communicates with satellites in space
- Battery operated



- Become familiar with your GPS unit
 - Enter button, zoom, move up/down and left/right, menu, backlight, quit, mark, goto/find
 - How to toggle between map and compass
 - Check battery levels
 - Compass
 - Will not display correct direction of travel until you are moving
- Mark a waypoint
- Find a waypoint/point of interest
- Edit/change coordinates

Navigating with GPS

https://youtu.be/clwl 4iUK2M

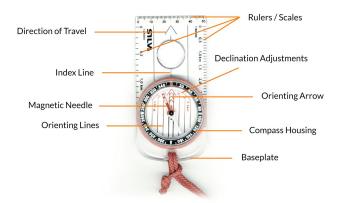
- Interference:
 - Atmospheric conditions, trees, power lines, buildings, cliffs, valleys, or other landscape features that affect the reception of the satellite signal
 - Takes longer to receive the satellite signal or lose signal
- NO GPS is 100% accurate
- Most units get you within 10-25 feet
- GPS points to a direction that is the shortest route
 - May not be the best/most accessible route
 - Look where you are going and what is ahead of you to choose the best way to get there
- Battery operated
 - Batteries may be low or die
- User Error
 - You may put in the wrong coordinates

Questing

- Map and compass
 - Important because GPS is imperfect
 - Information about actual terrain

Using a Map and Compass

https://youtu.be/0cF0ovA3FtY



Questing

GPS vs Map

Similarities

- Navigation tools
- Use coordinates

Differences

- Access to map is harder
- Maps can be outdated
- GPS tells you exactly where you are
- GPS requires a battery
- GPS is more expensive

Questing

Benefits

GPS

- Relatively easy to use
- Free service
- Tells exact location
- 100% coverage on the planet
- Weather doesn't matter
- Easy to integrate into other tech, like cellphones
- Best for navigation on water
- Constantly Up-to-date
- Geocaching is super fun

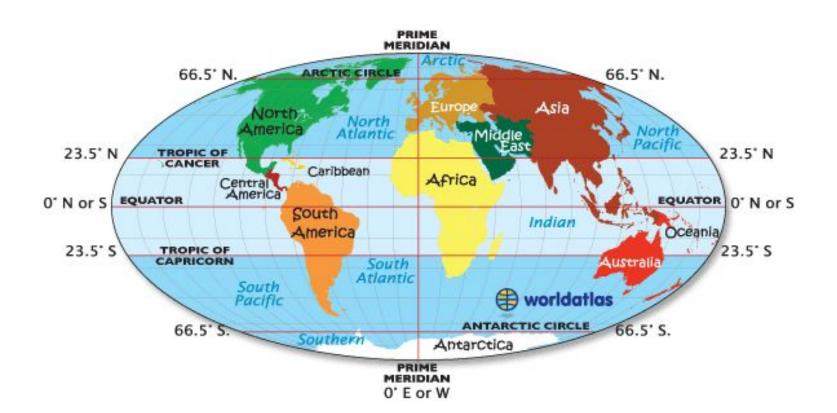
Map-Reading

- Reliable
- Terrain information
- Data comparison for historical purposes
- Show the Earth's entire surface or a small part and can show it in great detail
- Can show landforms, political boundaries, bodies of water, position of cities

Determining Coordinates: Latitude and Longitude

The globe is divided into vertical and horizontal lines

- Latitude: Parallels
 - Horizontal lines
 - North Pole is 90 degrees north
 - South Pole is 90 degrees south
 - Distance North or South of the Equator, 0 degrees
 - o 0-90 degrees
- Longitude: Meridians
 - Vertical lines
 - East to West
 - Distance East or West of the Prime Meridian
 - 0-180 degrees
 - o Prime Meridian, O degrees, runs through Greenwich, England



Determining Coordinates: Latitude and Longitude

- Each degree is divided into 60 minutes
- Each minute of latitude and longitude is 60 seconds
- Format used for Coordinates
 - Degrees, Minutes, Seconds
 - Coordinates for Bass Pro Shop Pyramid in Memphis, TN
 N 35 ° 9′ 21.91″ W 90 ° 3′ 5.82″
- GPS users and Geocaching.com
 - Use a different format of degrees and decimal numbers
 - o N 35.1560 W 90.0516

Determining Coordinates: UTM- Universal Transverse Mercator

- Rectangular grid-based map overlay
- Depicts round globe on a flat surface
- Uses meters
- Coordinates read East then North
- Divides Earth into 60 zones
 - Each zone = 6 degrees of longitude
- 20 latitude bands that are 8 degrees high
 - Each band lettered from C to X (no I or O to avoid confusion with numbers 1 and 0)
 - Ends at 84 degrees N Latitude
- Zones have horizontal and vertical lines every 1000 meters (1 kilometer)

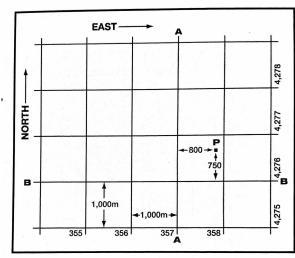
Determining Coordinates: UTM- Universal Transverse Mercator

Easting

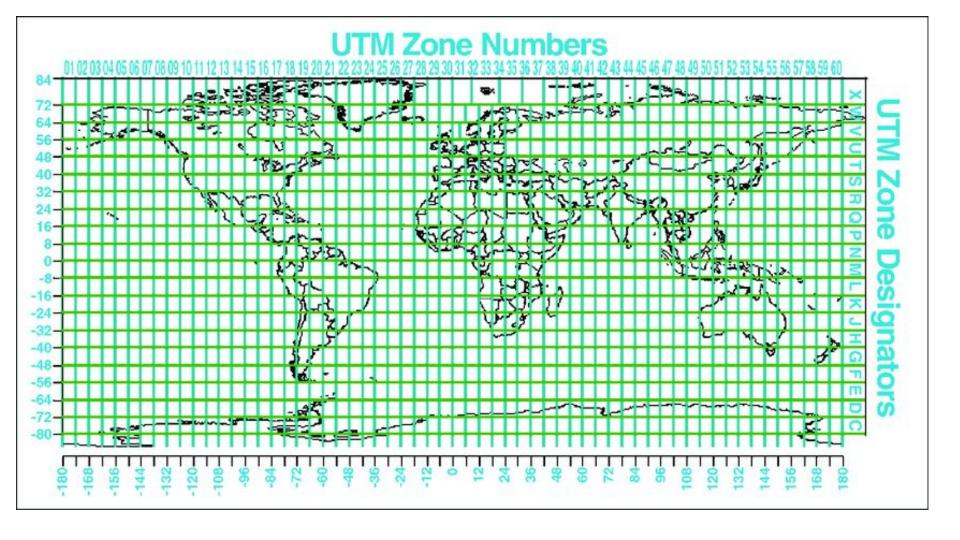
- Measured from Central Meridian
- o Central Meridian is 500,000 meters east
- Value of the nearest grid line west of it plus its distance east of that line

Northing

- Measured from Equator
- o Equator is 10,000,000 meters
- Value of the nearest grid line south of it plus its distance north of that line



The grid value of line A is 357,000 meters east, and line B is 4,276,000 meters north. Point P is 800 meters east and 750 meters north of the grid lines. Therefore, the grid coordinates of point P are east 357,800 meters and north 4,276,750 meters.



Determining Coordinates: UTM- Universal Transverse Mercator

Plot a UTM waypoint on a map. Compare the accuracy to that found with a GPS unit

https://youtu.be/J6j sJyyudl

https://youtu.be/mv7ZnNFsgsQ

• Step 1: Research

- Signup at <u>www.geocaching.com</u> free basic membership
- Click "Hide & Seek a Cache"
- Enter zip code then click search
- Information is available on distance away, what type, difficulty, ranking, attributes
- Choose a geocache and enter coordinates into your GPS unit
- Practice with your GPS unit for proficiency
- Study maps of the area
 - City: road map
 - Rural: topographic map

Preparation

- GPS unit
- Extra batteries
- Cache page
- Water
- Friend
- Swag to trade
- o Pen/Pencil
- Bug Spray
- CITO bag
- Sense of Adventure
- Second Breakfast



Step 2: Safety

- Bring a friend
- Tell someone where you are going and when to expect you to return
- o Carry a compass, map, whistle and First Aid kit
- Dress for the weather and terrain
- Be aware of your surroundings
- Wear blaze orange during hunting season

• Step 3: The Hunt

- Mark your car and/or trailhead
- Stay on the trail
- Watch your step
- Use GPS compass to lead you to the cache
- Slow down when you are within 300 feet
- Begin to search when you are within 30 feet
- May put GPS away and use own geosense



- Step 4: The Actual Find
 - Write about it in the logbook
 - Using geocaching handle (name) and date
 - Take something, Leave something
 - Try to make it of equal value
 - Only take a Trackable if you plan on replanting it elsewhere
 - Put cache back better than how you found it
 - Make sure lid is on tight
 - Replace it as accurately as possible with appropriate camo
 - Log onto Geocaching.com and share your experience



Mark and Edit a waypoint

https://youtu.be/HCmWnXZVyZc



- Read and follow guidelines on Geocaching.com
- Park and cities may have special rules or ordinances
- Same as finding: 4 steps



- Step 1: Research
 - Good place to hide it?
 - Must be within 0.1 miles (528 feet) away from others
 - Think "where would I like to find a cache"
 - Hide a cache where there will be minimal risk to the environment



- Step 2: Safety
 - Must be in a safe location
 - If on private property, ask permission
 - Not allowed to be placed near railroads, bridges, school property, or military bases



- Step 3: The Hunt
 - Accurate coordinates
 - Supply a clue (hint)
 - Write "Geocache" on outside of container
 - To prevent "muggling" getting taken by a non-geocacher
 - Make sure geocachers can find your hide
 - Can have a theme



- Step 4: The Actual Find
 - Use watertight container
 - Lock N Locks
 - Ammo cans
 - Film canister
 - Put a "cache note" in the cache
 - Can be printed off Geocaching.com
 - Put logbook in waterproof bag (ziplock)
 - Leave the pencil out so it doesn't poke holes in the bag
 - Load the cache with swag
 - Do not put food, fireworks, or any other dangerous materials
 - Family friendly

- Submitting the Geocache
 - On "Hide and Seek" page, click on the Online Form
 - Complete all information on the form and submit
 - Add attributes
 - Volunteer reviewers will review your listing
 - If there are questions, they will email you
 - If no questions and it meets guidelines, they will publish your new geocache on Geocaching.com
 - Get ready for that first geocacher to log the FTF (First to Find)

Maintain It

- Read the logs that geocachers send you
 - They will let you know if it is wet or damaged and if the logbook is full
 - If you get a few DNF (Did Not Find), you may want to check the site to see if it was muggled
- Maintain integrity of surrounding environment
- Try to maintain it for at least 6 months
- If you can no longer maintain the cache, you need to archive it on the website and remove the geocache



- Never bury a cache
 - It would damage the surrounding environment
 - Can you imagine what it would like if everyone walked into that section of the woods or field and started digging. Remember GPS is not 100% accurate



Geocaching Etiquette: Geocacher's Creed

- When placing or seeking geocaches, I will
 - Not endanger myself or others
 - Observe all laws and rules of the area
 - Respect property rights and seek permission where appropriate
 - Avoid causing disruptions or public alarm
 - Minimize my and others' impact on the environment
 - Be considerate of others
 - Protect the integrity of the game pieces

Rule 1: Keep Safe

- Stay far away from road traffic and railroad crossings
- o Don't place a cache higher than 6 feet or require dangerous climbing to reach it
- Don't require people to swim to reach the cache
- Public caches are often magnetic containers stuck onto electric switch boxes: AVOID THESE
- Always enforce the buddy system



- Rule 2: Respect the Environment
 - Never bury a cache in the ground
 - Avoid sensitive ecosystems. Place caches in reach of an existing trail access
 - Don't place caches in archeological or historic sites
 - o Don't deface any object, natural or manmade
 - Don't hide caches in light post bases, sprinkler heads, or other commonly present sites



- Rule 3: Respect Private Property
 - Get permission from land managers to use parks and Scout camps for your events
 - It is unlawful to place caches in National Parks or National Wildlife Refuges
 - Local laws and policies vary so check with city, county, or state ordinance offices
 - No caches at military bases, school properties
 - Avoid targets for terrorist attacks: highways, bridges, damns, government buildings, and airports (to avoid fear and confusion)

- Rule 4: Be a Positive Ambassador for Scouting
 - Geocache using the Scout Oath and Law

The Outdoor Code

As an American, I will do my best to

Be Clean in my outdoor manners, Be Careful with fire, Be Considerate in the outdoors, and Be Conservation-minded.

THE SCOUT OATH On My Honor I Will Do My Best: To do my duty to God and my country, and to obey The Scout Law; To help other people at all times; To keep myself physically strong, mentally awake, and morally straight. THE SCOUT LAW 1. A scout is trustworthy. 2. A scout is loval. 3. A scout is helpful. 4. A scout is friendly. A scout is courteous. A scout is kind. A scout is obedient. 8. A scout is cheerful. 9. A scout is thrifty. 10. A scout is brave. 11. A scout is clean. 12. A scout is reverent.

CITO

- Cache-In-Trash-Out
 - Always carry a trash bag and remove litter along the route
- Follow Leave No Trace guidelines
- Be mindful of the surrounding area of the cache
 - Don't trample the ground, rip up property in the search of a cache
- Follow all laws and regulations. Never enter private property without permission
- Write an entry in the logbook at the cache

Leave No Trace

7 Principles

- Plan Ahead and Prepare
 - Check weather, be safe, follow laws/policies, know how to use GPS unit and map/compass
- Travel and Cache on Durable Surfaces
 - Stay on the trail, avoid creating new geotrails, avoid sensitive ecosystems
- Dispose of Waste Properly
 - Cache in, Trash Out
 - Use established bathrooms when available. If not, deposit waste in catholes 6-8 inches deep at least 200 feet away from water sources, campsites, trails, and caches
- Leave What You Find
 - "See it as it is, leave it as it was"
- Minimize Campfire Impacts
 - Typically doesn't apply, but know regulations

Leave No Trace

- 7 Principles
 - Respect Wildlife
 - Never leave food at a cache
 - Dogs on a leash
 - Observe wildlife from a distance
 - Be Considerate of Others
 - Yield to those on a trail
 - Avoid loud noises
 - Do not trespass

Planning

- Properly plan a geocache hunt
 - Plan ahead
 - Practice using GPS unit and Map/Compass
 - Buddy system and Share your plan with others
 - Watch the weather
 - Obtain coordinates for GPS unit and map route
 - Wear proper proper attire and carry a compass, map, whistle and First Aid kit
 - Bring plenty of water and a snack



Safety

- Follow your family's rules for going online
- Protect your privacy
- Do not open emails or files from people you do not know or trust
- If you receive/discover information that makes you uncomfortable, leave it and tell your parents
- o Do not believe everything you see or read online
- NEVER agree to get together with someone you "meet" online
- NEVER give personal information like email, phone number, address
- NEVER share your Internet passwords with anyone
- NEVER shop online unless you have your parent's permission to do so
- Be a good online citizen

Go to www.geocaching.com Type in your zip code to locate public geocaches in your area. Share the posted information about 3 of those geocaches. Pick 1 of the 3 and find the cache.

38103 Geocaching

Sun Studio

- GC74EQ. Traditional
- o Difficulty: 1
- o Terrain: 1.5
- Size: Small
- N 35 ° 8.364′ W 90 ° 2.256′

Go To Jail

- GC6BGRH. Traditional
- o Difficulty: 2
- o Terrain: 1.5
- Size: Micro
- o N 35 o 9.484' W 90 o 2.973'

Big River Crossing

- o GC6W3EB. Traditional
- Difficulty: 1
- o Terrain: 1
- Size: Micro
- o N 35 · 8.114 W 90 · 5.140'

Do ONE of the following:

- a. If a Cache to Eagle series exists in your council, visit at least 3 of the locations in the series. Describe the projects that each cache you visit highlights, and explain how the Cache to Eagle program helps share our Scouting service with the public.
- b. Create a Scouting-related Travel Bug that promotes one of the values of Scouting. "Release" your Travel Bug into a public geocache and, with your parent's permission, monitor its progress at www.geocaching.com for 30 days. Keep a log, and share it at the end of the 30 day period.

- c. Set up and hide a public geocache, following the guidelines in the Geocaching merit badge pamphlet. Before doing so, share with your counselor a 6 month maintenance plan for the geocache where you are personally responsible for the first 3 months. After setting up the geocache, with your parent's permission, follow the logs online for 30 days and share them.
- d. Explain what Cache In Trash Out (CITO) means, and describe how you have practiced CITO at public geocaches or at a CITO event. Then, either create CITO containers to leave at public caches, or host a CITO event for your unit or for the public.

Plan a geohunt for a youth group such as your troop or a neighboring pack, at school, or your place of worship. Choose a theme, set up a course with at least 4 waypoints, teach the players how to use a GPS unit, and play the game. Tell your counselor about your experience, and share the materials you used and developed for this event.

Examples

- Waypoint/Benchmark
 - points in the city/area and players send photo evidence (i.e. Tigers, famous buildings or sites)
- Letterboxing Hybrid
 - box with stamp and logbook. The players stamp the logbook with their own stamp and stamp their sheet with the cache stamp. Gotta collect 'em all and send visual proof.

How to Plan and Run a Geocaching Game

When setting up a game, consider the following steps.

- 1. Plan ahead. Decide what the game is for, who will take part, where it will be, what safety precautions must be followed, what you need to set up the game, and how you will clean up after the game.
- Get any permissions that are needed, including permission slips for the youth participants, permission from the property owner, and the permission of your senior patrol leader, Scoutmaster, or troop committee.
- 3. Set up the game ahead of time. Design and load the appropriate number of cache containers for your game, and hide them before people arrive.
- 4. Have clear rules and objectives for your game. Be sure each participant understands the safety rules and the principles of Leave No Trace.
- 5. Play the game!
- 6. Afterward, debrief the activity (that is, explain what the game was about).
- Clean up the area and be sure to pick up all cache containers from their hiding places.

- Match the skill level to the age
- Pick a theme
- Have fun

Tigers Around Town

https://alumni.memphis.edu/s/1728/15/index.aspx?sid=1728&gid=2&pgid=547

https://www.google.com/maps/d/viewer?msa=0&ll=35.11242478731344%2C-89.96377924902345&spn=0.1361%2C0.162735&mid=1 MKQfCv1GlaqBRTYoEbwncHgpnCM&z=13

https://www.flickr.com/photos/alumniassociation/sets/72157627672160750/

Gotta Find 'Em All

















- Archive
 - Removing your cache from public listing (or if a reviewer does it for you for lack of maintenance)
- Bearing
 - Compass direction from your current position to your intended destination
- Cache to Eagle
 - A series of public geocaches that have been set up at the sites of Eagle Scout service projects
- Camouflage
 - Disguising your cache container in a clever way
- Clue (Hint)
 - Give people a little more information to help find the cache. The cache name, part of the description, of an official hint can all be clues

- DNF- Did Not Find
- FTF First To Find
- GC Geocache Code
 - Each code assigned to a public geocache listing is unique
- Geocoin
 - o Trackable coins with unique ID numbers engraved on them. Can be collected or travel the world
- Geohunt
 - A game involving geocaching to hunt for clues or caches
- Ground Zero (GZ)
 - Point where you GPS unit shows you have reached the exact cache location. In reality you almost never reach true GZ

Heading

• The compass direction in which you are travelling or should be travelling. Measured in degree from Magnetic North and/or True North

Hide

- Shorthanded term for cache that is hidden
- Log-In Name (Handle)
 - An ID to use on the geocaching website to be identified by in the community

Map Datum

 A model used to match the location of features on the ground to coordinates and locations on a map. Factory setting for GPS units is usually WGS 84

Reviewer

Volunteers from around the world check new listings for various issues and then publish on Geocaching.com

- Spoiler
 - Information that gives away the location of the find
- Swag
 - "Stuff we all get" refers to the toys and other trade items in a cache
- TFTC- Thanks For The Cache
- TFTH- Thank For The Hide
- TNLN- Took Nothing Left Nothing
- TNSL- Took Nothing Signed Log
- Travel Bug
 - An item that travels from cache to cache with a trackable number written on a metal tag so you can record on Geocaching.com where you picked it up and where you dropped it off. Often have a mission

- WAAS- Wide Area Augmentation System
 - Combination of satellites and ground stations that increase GPS receiver accuracy
- Watchlist
 - List of users who are watching a specific Travel Bug or cache