Girl Guides
BC Council

Navigation Challenge

AN OUTDOOR CHALLENGE
FROM THE BC CAMPING COMMITTEE

Girl Guides
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OBJECTIVES

The BC Girl Guide Navigation Challenge is designed to get girls & Guiders to learn about navigation in a fun way. This includes learning about using a compass, reading a map, geocaching and GPS technology.
To get you started, there is some information included about the history of geocaching, types of geocaches and how to set up your own geocache or send out a trackable.

CHALLENGE REQUIREMENTS

To earn the Navigation Challenge crest, complete all sections of the challenge for your branch. *Note: Caches set up for a geocache hunt meeting can be temporarily set up without being logged.*

Branch	Section A	Section B
Sparks	**Learn about compasses** -What are the parts of a compass? -How do you use a compass? **Learn about maps** -How do you read a map? **Learn about geocaching** -When did it begin? -Where is the very first geocache located?	**Do Some Compass Activities …** -Do two compass activities to learn how to use a compass. **Do a Map Activity …** -Do a map activity to learn how to use a map. **Go Geocaching…** -Find a geocache in your neighbourhood and log your finds onto www.geocaching.com.
Brownies & Guides	**Learn about compasses** -What are the parts of a compass? -How do you use a compass? **Learn about maps** -How do you read a map? **Learn about geocaching & GPS units** -When did it begin? -Who created the term geocaching? -Where is the very first geocache located? -How does a GPS work?	**Do Some Compass Activities …** -Play 2 compass activities to learn how to use a compass. **Do Some Map Activities …** -Do 2 map activities to learn how to use a map. **Go Geocaching …** -Find two different types or sizes of caches in your neighbourhood. Log each of your finds onto www.geocaching.com. -Learn how to create and maintain a geocache **or** -Learn about a trackable (geocoin or travel bug) using www.geocaching.com, look at the history to follow where it has traveled, what are its goals, if possible find a trackable in your area and move it to a new location.

		OPTIONAL: Send out your own trackable item or create your own geocache.
Pathfinders	**Learn about compasses** -What are the parts of a compass? -How do you use a compass? **Learn about maps** -How do you read a map? **Learn about geocaching & GPS units** -When did it begin? -What is Selective Availability and why was getting rid of it important to geocaching? -Where is the very first geocache located? -How does GPS work?	**Do Some Compass Activities …** -Play 3 compass activities to learn how to use a compass. **Do Some Map Activities …** -Do 2 map activities to learn how to use a map. **Go Geocaching …** -Find at least three different types or sizes of caches in your neighbourhood. Log each of your finds onto www.geocaching.com. -Learn about a trackable including its goals and where it has traveled, if possible find a trackable in your area and move it to a new location. -Create a geocache with your Unit and post it. **or** Send out a trackable into the world and track its progress on www.geocaching.com.
Rangers & Adults	**Learn about compasses** -What are the parts of a compass? -How do you use a compass? **Learn about maps** -How do you read a map? **Learn about geocaching & GPS units** -When did it begin? -What is Selective Availability and why was getting rid of it important to geocaching? -Where is the very first geocache located? -How do GPS's work?	**Do Some Compass Activities…** -Do 4 compass activities to learn how to use a compass. **Do Some Map Activities …** -Do 3 map activities to learn how to use a map. **Go Geocaching …** -Find at least three different types or sizes of caches in your neighbourhood. Log each of your finds onto www.geocaching.com. -Create a geocache with your Unit and post it. **or** Send out a trackable into the world and track its progress on www.geocaching.com. -Create a geocache hunt meeting for a local Spark, Brownie, or Guide or Pathfinder Unit.

COMPASS

A compass is a navigation instrument used to indicate direction. It was first invented in China. It has a magnetized needle that rotates so it lines up with the Earth's magnetic field. The ends of the compass point to magnetic North Pole and magnetic South Pole. Note that the Magnetic North Pole is not the same as Earth's Geographic North Pole. The Magnetic North Pole moves about 64 km per year. The Magnetic North and Magnetic South Poles have switched places many times since the beginning of time.

PARTS OF A COMPASS

A compass consists of the following parts:

1. **Baseplate**
   It is clear so that when a map is below it, you can see the map.

2. **Ruler**
   A ruler is located on the side of the compass so that you can use it with the map scale to calculate distance.

3. **Direction-of-Travel Arrow**
   Indicates which direction you should point the compass to when you are taking or following a bearing.

4. **Rotating Bezel (aka Azimuth Ring)**
   The large circle marked with degrees from 0 to 360 around its circumference.

5. **Index Line (aka Read Bearing Here Mark)**
   A small marker, located directly above the bezel, that marks where you will read your bearing.

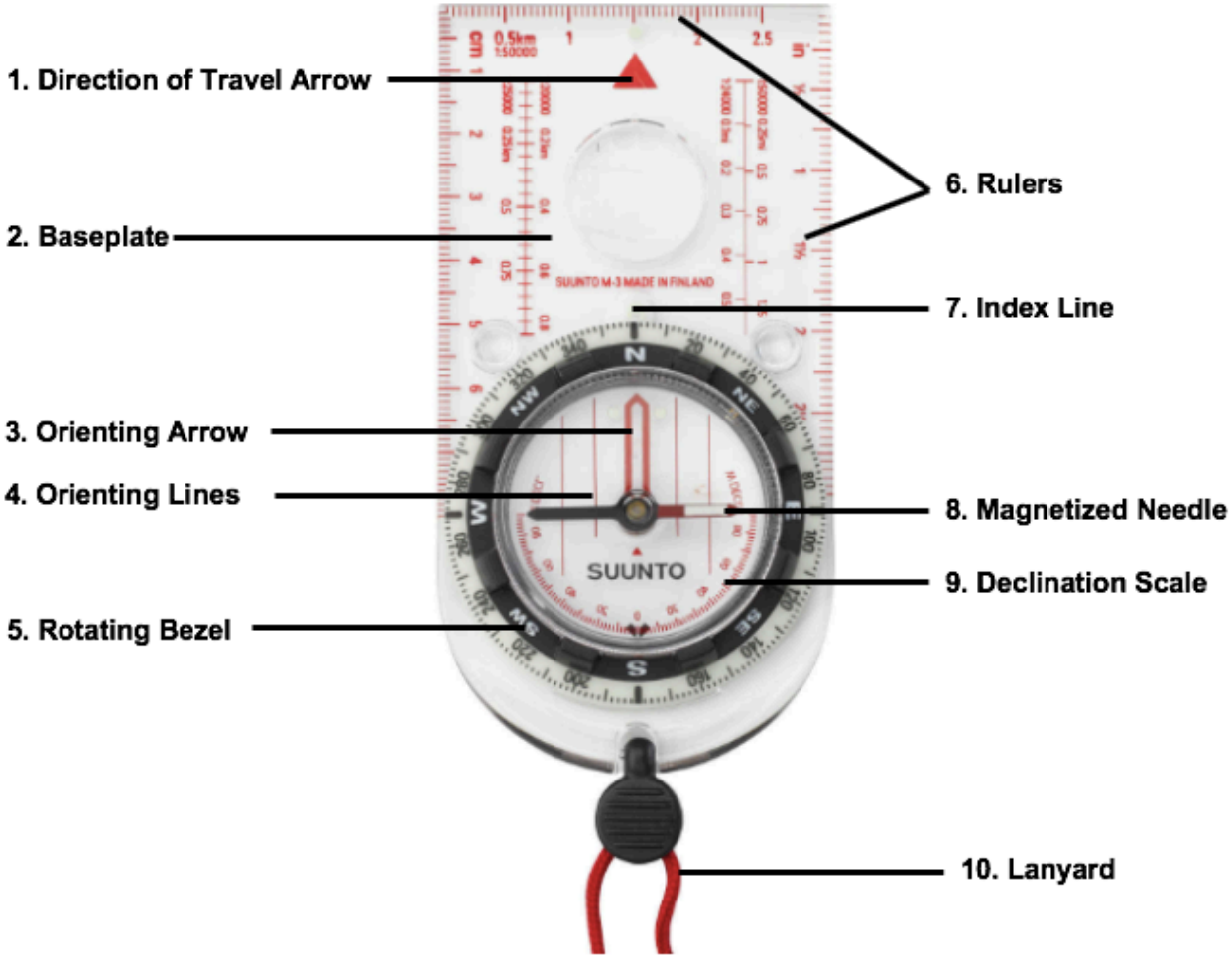
6. **Magnetized Needle**
   A needle inside the bezel that always points to the magnetic north pole.

7. **Orienting Arrow**
   A big red arrow, inside the rotating bezel, which you will use to orient the bezel.

8. **Orienting Lines**
   Parallel lines inside the bezel that you will use to line up the compass with north-south lines on the map.

9. **Declination Scale**
   This is used to adjust declination.

10. **Lanyard**
    A cord attached to the end of the compass to help you carry the compass.



HOW TO USE A COMPASS TO FOLLOW A BEARING

1. A **bearing** describes a direction in terms of degrees. Hold the compass in front of you with the **direction-of-travel arrow** pointing away from you.
2. Think of the red magnetized needle as “Red Fred” and the hollow orienting arrow as “the shed”. To use the compass to follow a specific bearing, put “**Red Fred in the Shed**”. Rotate your entire body, not the compass, until the **magnetized needle** is inside the **orienting arrow**.
3. For example, if you want to move at a bearing of 200°, do the following steps:
   i. Turn the rotating bezel until the 200° mark is lined up with the direction of travel arrow.
   ii. Point the direction of travel arrow away from your waist and at the desired object. Keep the compass level and in front of you.
   iii. Turn your entire body until you get “Red Fred in the Shed”. You are now facing a bearing of 200°. Move in the direction that the direction-of-travel arrow is pointing.

HOW TO TAKE A BEARING IN THE FIELD

1. Find a landmark that you can identify in front of you and on your map.
2. Hold the compass so that the direction of travel arrow is pointing away from you and directly at the landmark.
3. Rotate the rotating bezel until the magnetized needle is inside the orienting arrow. Remember “Red in the Shed”. You have captured the bearing.
4. Place the compass on the map with its edge lined up with the landmark. Point the direction-of-travel arrow to the direction of the landmark. With the edge of the compass lined up against the object, rotate the entire baseplate until the orienting lines are running north-south and the north marker on the bezel is pointing north on the map.
5. Draw a line along the edge of the compass. You are somewhere along this line.

HOW TO TAKE A BEARING FROM A MAP

1. Set the declination on the compass. **Declination** is the difference between magnetic north and true north. The needle in your compass will only point to magnetic north. To find the current declination for your region, look on the map for the direction and degree. Set the declination by moving the **orienting arrow** to the correct degrees.
2. Find your current location on the map.
3. Place the compass on the map so that the flat side of the **baseplate** lines up with your current position.
4. Locate your destination on the map. Rotate the entire compass until it forms a line between your current position and your destination. Ensure that the **direction-of-travel arrow** is pointing in the direction of the destination.
5. Once the compass is in position, rotate the **rotating bezel** until the orienting lines are lined up with north and south on the map. Make sure that the north marker on the rotating bezel is pointing to north on the map.
6. Look at the **index line** to read the bearing that you just captured. Now you are ready to use the compass to follow the bearing.

COMPASS ACTIVITIES

1. Simon Says Game

Equipment: compass
Instructions:
1. Girls stand up while the leader gives direction. For example, “Simon says take five steps northeast. Simon says hop on one foot to the west.”
2. If the leader does not say “Simon says” before the directions, then the girls should not follow the directions. If they do, they are out and must sit down on the ground.

2. Direction Facing Race

Equipment: compass, four walls on a gym
Instructions:
1. Designate one wall as “north (N)” and the opposite facing wall as “south (S)”. The other two walls will be “east (E)” and “west (W)”. The four corners of the gym will be “northeast (NE)”, “northwest (NW)”, southeast (SE)” and “southwest (SW)”.
2. All the girls start in the centre of the gym, facing north.
3. The leader will call out a direction (eg. southwest (SW) and all the girls must run to that wall or corner of the gym. The last girl to get there is out.

3. Compass Walk

Equipment: compass, large grassy field
Instructions:
1. Place a Girl Guide cookie wrapped in saran wrap on the ground. Have a girl stand where the cookie is placed.
2. The girl sets her compass at 360°, faces north and then takes 20 steps.
3. She then sets her compass to 120°, faces that bearing and takes another 20 steps.
4. She then sets her compass to 240°, faces that bearing and takes another 20 steps.
5. The girl should be within a metre of the cookie. She can have the cookie at the end of the walk.

4. Squirrel, Squirrel Game

Equipment: compass, instruction sheet, squirrel cut-outs, pushpins
Instructions:
1. Attach the squirrel cut-outs to trees in a large area with a pushpin.
2. Have each girl stand at a designated starting point with written directions using cardinal points (eg. 20 steps southwest or 18 steps northeast, etc.). To add some variation, the written directions could have bearings (eg. 200°, 120°, or 50°, etc.).
3. If the girl follows the instructions properly, they should lead her to the squirrel cut-out.

5. Water Bottle Walk

Equipment: compass, water bottle
Instructions:
1. Have each girl place a water bottle on the ground at her feet.
2. Get her to set her compass on a bearing of her choice (eg. 50 degrees) and take a sighting. Ask her to take 10 steps in the direction of the bearing. Stop.
3. Get her to add 120 degrees to the first bearing and take a sighting. Ask her to take 10 steps in the new direction. Stop.
4. Get her to add 120 degrees to the first bearing and take a sighting. Ask her to take 10 steps in the new direction. Stop.
5. Get her to add 120 degrees to the first bearing and take a sighting. Ask her to take 10 steps in the new direction. Stop. Get her to look down on the ground and she should see the water bottle.

6. Compass Treasure Hunt

Equipment: compass
Instructions:
1. Hide the treasure.
2. Give clues to the treasure using only compass bearings and the distance in the number of steps to the next clue.
3. Give each team a compass and the first clue. Subsequent clues will be given out once the team reaches the correct destination.

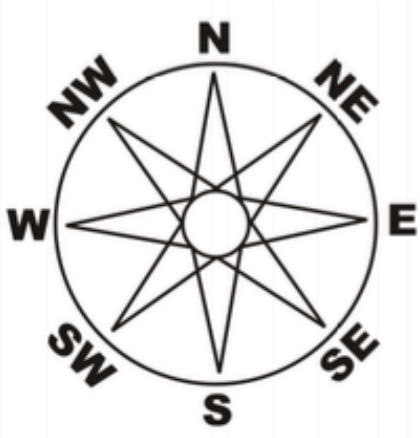
7. Make a Homemade Compass

Equipment: compass, glass bowl with water, needle, piece of cork, magnet
Instructions:
1. Take a needle and rub it on a magnet in the same direction 40 times. This will magnetize the needle.
2. Place the needle on a piece of cork that is floating in a bowl of water.
3. The ends of the needle should point in the direction of the Earth's magnetic north and south poles.

8. Compass Message Puzzle

Instructions:
1. Use the compass on the right to decode the hidden message shown below.
2. To decode the hidden message, start at the trefoil each time for every single letter.
3. Write down the letter it leads you to in the blank space of the hidden message.

W	C	A	S	B	K	V
U	L	I	T	D	O	Z
R	F	E	J	I	T	G
Y	H	N		Q	P	O
R	D	M	B	S	A	U
D	N	E	Y	F	X	M
O	J	V	G	D	L	B



1NE	2E	3W,1N	3SW	2S,3E	1W, 2N	1S,1E	1NW

2N	2N,2E	3W,2S	3E	1SW	2S

3SE	1W,2S	3N	2E,1N

ANSWER KEY:

W	C	A	S	B	K	V
U	L	I	T	D	O	Z
R	F	E	J	I	T	G
Y	H	N		Q	P	O
R	D	M	B	S	A	U
D	N	E	Y	F	X	M
O	J	V	G	D	L	B

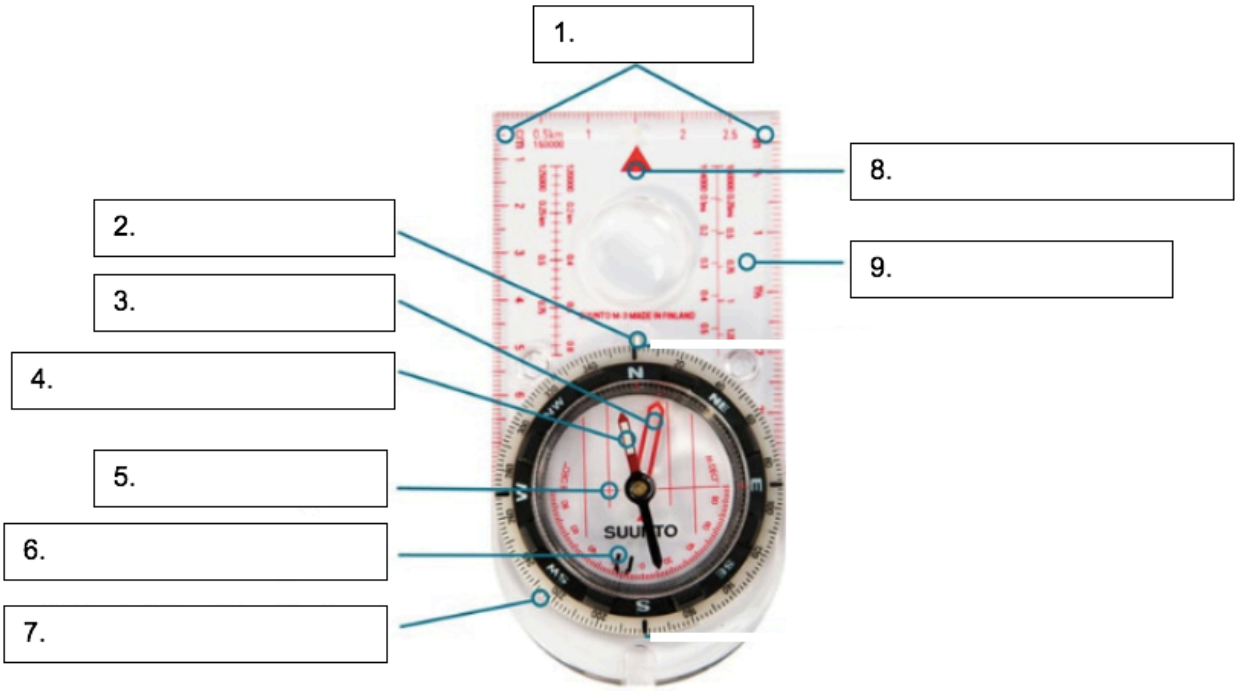
I		P	R	O	M	I	S	E
1NE		2E	3W,1N	3SW	2S,3E,1W, 2N		1S,1E	1NW

T	O		D	O		M	Y
2N	2N,2E		3W,2S	3E		1SW	2S

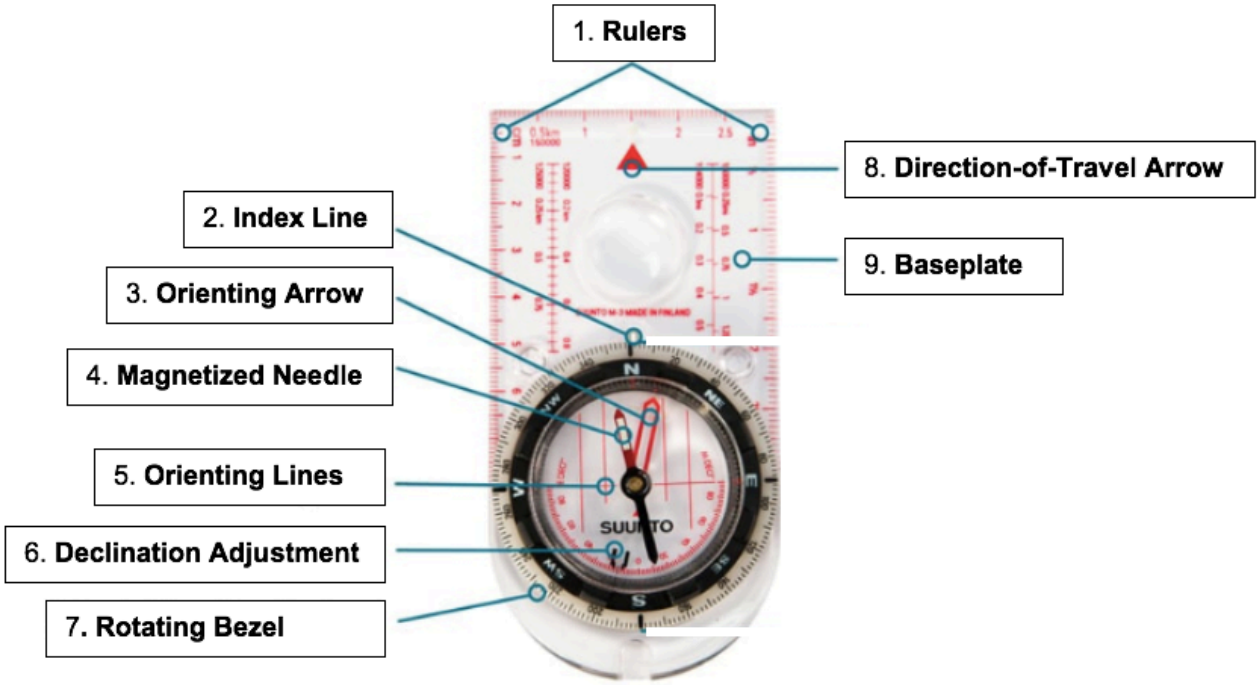
B	E	S	T
3SE	1W,2S	3N	2E,1N

9. Compass Parts

Label the different parts of a compass.



ANSWER KEY:



MAP ACTIVITIES

1. Types of Maps Activity

Equipment: different types of maps (eg. transit maps, mazes, street maps, road maps, floor plans, star maps, topographical maps, city map with tourist attractions, BC map, Canada map, etc.)
Instructions:
1. Provide different types of maps for the girls to look at.
2. Ask the girls what type of information is provided on each type of map.

2. Contour Lines Activity

Equipment: topographical map, knife, potato, paper, pencil, cutting board
Instructions:
1. Cut a potato in half. Place each potato piece with the flat side down so it looks like a mountain.
2. Make horizontal slices of equal thickness along the potato. Stack the slices with the widest piece on the bottom and the smallest piece on top.
3. Look at the potato mountain from the top. Do you see rings from the individual slices? These are the contours. Draw a map of the potato mountains.
4. Look at a real topographical map. Locate:
   a. a hilltop or mountaintop – innermost loop
   b. steep regions – lines drawn close together
   c. flat areas – no lines

3. Map Bearings

Equipment: compass, map of a park with hiking trails
Instructions:
1. Place the edge of a compass against a trail on a map.
2. Turn the rotating bezel until the orienting lines are parallel to the north of the map.
3. Read the bearing on the compass.

4. Trail Bearings

Equipment: compass, map of a park with hiking trails
Instructions:
1. Point the compass at an object of interest (eg. mountain, lake, etc.).
2. Turn the rotating bezel until the N on the bezel is directly in front of the red magnetized needle.
3. Read the bearing that is at the top of the compass.
4. Recreate the compass bearing on the map as a line from your current location. The object of interest should be along this line.

GEOCACHING

Geocaching is a real-world, outdoor treasure hunting game using GPS-enabled devices. Participants navigate to a specific set of GPS coordinates and then attempt to find the geocache (container) hidden at that location.

GEOCACHING TERMS

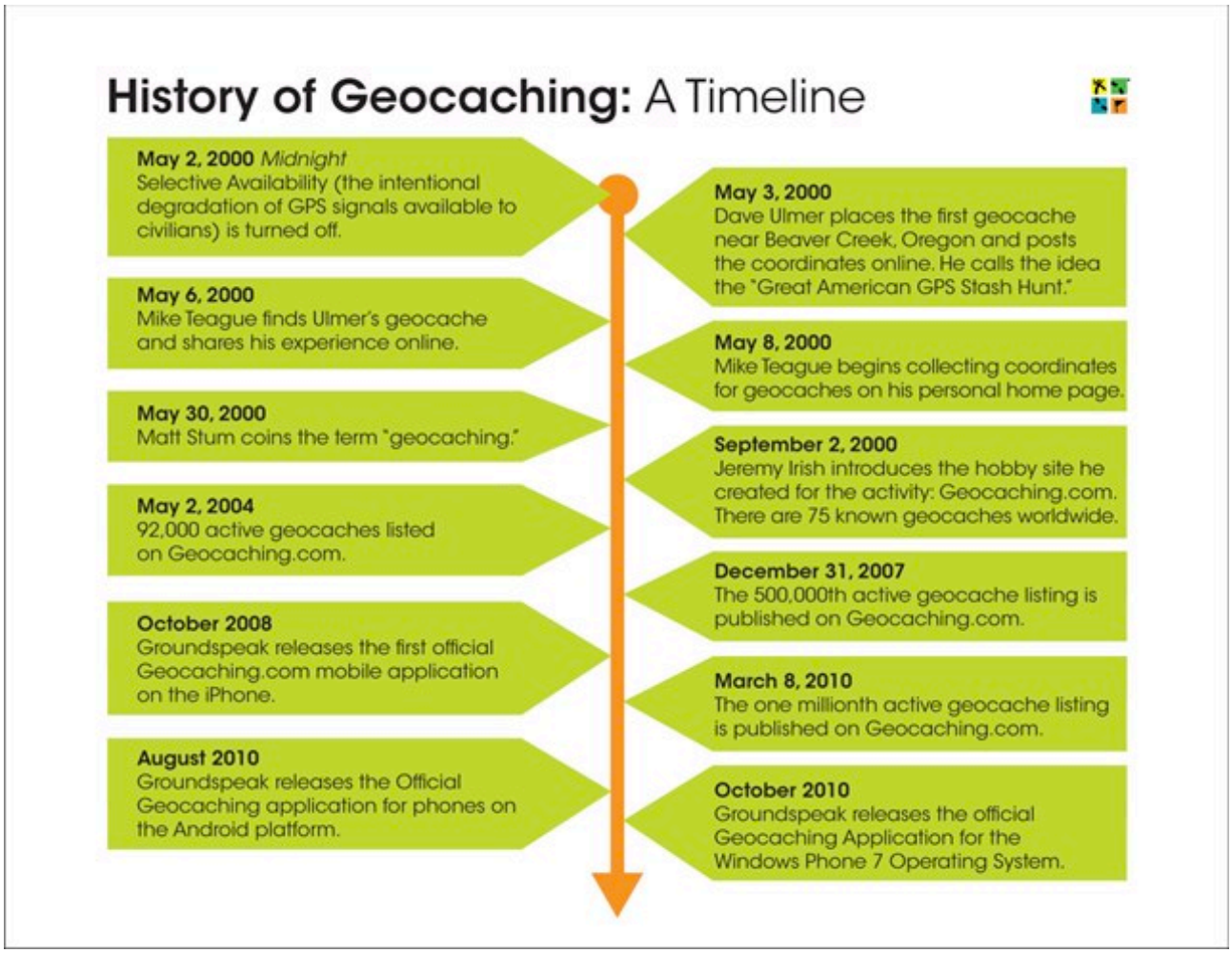
Cache	short for geocache
Muggle	non-geocacher
Coordinates	latitude/longitude of geocache
Swag	trade items inside geocache
GPS	device used to find a geocache
DNF	did not find
FTF	first to find
Muggled	cache has been vandalized or stolen
Trackables	special objects inside a geocache

A BRIEF HISTORY OF GEOCACHING

The **Global Positioning System (GPS)** originally known as the Navstar Global Positioning System was first launched in 1978 and was designed, built, and operated by the U.S. Department of Defense. By the mid-1990s the system was fully operational. That is when the first commercial GPS became available on the market. The Department of Defense didn't want their technology used against them so they instated a process called Selective Availability, where they introduced some "noise" into satellite signals, which affected satellite signals and reduced their accuracy to only about 15 metres. On May 2, 2000 President Bill Clinton decided to turn off **Selective Availability**, which made commercial GPS units accurate up to about 3 metres.

On May 3, 2000, Dave Ulmer hid the first geocache in the woods near Beaver Creek, Oregon near Portland (N 45 17.460 W 122 24.800) and posted it on an internet GPS users' group. It was a black bucket with a logbook, pencil and various prizes. Mike Teague, the first person to find Ulmer's stash, began gathering the online posts of coordinates around the world and documenting them on his personal home page. The "GPS Stash Hunt" mailing list was created to discuss the emerging activity.

The term "geocaching" was first coined by Matt Stum on the "GPS Stash Hunt" mailing list on May 30, 2000. Jeremy Irish, a web developer for a Seattle company, after stumbling upon Mike Teague's web site in July decided to create a tool to improve the cache-hunting experience, and on September 2, 2000 **www.Geocaching.com** was launched. As of February 2016 there are 2,776,441 active geocaches and over 15 million geocachers worldwide. The world has truly become a geocachers' playing field!



Source:
https://www.geocaching.com/geocache/GC5RG90_15-years-of-geocaching-challenge-bop?guid=a7d2c0cc-f225-4852-9f4a-be1378eb15f6

TYPES OF GEOCACHES

There are 6 basic types of geocaches that you can create.

	**Traditional** – A single container with a logbook inside is hidden inside at coordinates for geocachers to find.
	**Multi-Cache** – A geocache that involves multiple locations. Typically once you're at the first stage, you will receive a clue to the whereabouts of the second stage and so on.
	**Puzzle or Mystery Cache** – A geocache that involves you solving a puzzle or riddle to get the final coordinates to find the geocache.
	**Earth Cache** – A type of geocache that takes you to a special geological location to learn about the location. There can be a physical geocache to find, but mostly you need to answer questions about the geological location to log the geocache.
	**Event Cache** – Is a gathering of geocachers. The Event Cache page specifies a time for the event and provides coordinates to its location. After the event has ended, it is archived. *(Tip - Could be done as a guiding event.)*
	**Cache In Trash Out** – Is an event where geocachers meet at a location to clean up and preserve the natural area they enjoy geocaching in. There they can clean-up litter, remove invasive species, plant trees or vegetation and/or building or help maintain hiking trails. *(Tip - Could be done as a community service project.)*

TRACKABLES

Trackables are a special type of object found within geocaches that contain unique tracking codes and have special missions they are trying to complete, which another geocacher has released for others to find. They are not to be kept, but instead discovered, logged and moved to another geocache!

There are two main types of trackables: **travel bugs** and **geocoin**. Travel bugs resemble dog tags and are usually attached to small objects. Geocoins resemble coins though there are many variations.

Travel Bug:

Geocoin:

If you find a trackable make sure you log where you picked it up from and where you dropped it off at https://www.geocaching.com/track/. If you would like to release your own trackable to other geocachers to find and move on you can purchase them online from many online geocaching stores. *(Tip – Your unit can release a trackable and see how far it gets as a program activity.)*

HOW TO START GEOCACHING

1. Register for a free membership at www.geocaching.com.
2. Visit the "Find a Geocache" under the Play menu.
3. Enter your postal code and click "search".
4. Choose any geocache from the list and click on its name.
5. Enter the coordinates of the geocache into your GPS Device.
6. Use your GPS device to assist you in finding the hidden geocache.
7. Sign the logbook and return the geocache to its original location.
8. Share your geocaching stories and photos online.

RULES FOR GEOCACHING

1. Write in the logbook.
2. If you take something, leave something. Trade even or up.
3. Place the geocache back in the same place where you found it.
4. Please respect the environment you are geocaching in and try and be as stealthy as possible. If someone asks you what you are doing be polite and explain to them what geocaching is.

HOW TO CREATE AND HIDE A GEOCACHE

For more detailed information on how to create and set-up a geocache please visit https://www.geocaching.com/play/hide.

1. **Search for existing geocaches before trying to create and hide your own.** Try to find a variety of cache types and sizes in various terrains and locations and covering the spectrum of difficulty levels. This will allow you to determine which things work well and help you form wise choices in this endeavor.

2. **Pick the type of geocache to set up.** While the Traditional caches might be the first that come to mind to set up, EarthCaches are a great idea to set up to encourage others to visit a geological feature, Event Caches can be done as a one time Guiding event, and the Cache In Trash Out could be set up as a community service project.

3. **Find a good spot for your geocache.** A quality geocache will be hidden near something of natural, human, historic, or scenic interest or at least at the end of a pleasant walk. Try to make it a place that people would enjoy visiting even if the cache wasn't there.

4. **Make certain geocaches are allowed there.** If it is private property, obtain permission from the land owner. Some park systems require permits and some do not allow geocaching, so check with park management to make sure geocaching is allowed and then obtain a permit if required.

5. **Select an appropriate container.** Geocache containers should be waterproof and durable. A good seal is important, because, if water leaks in, the cache will be ruined.

6. **Label the outside.** Clearly labeling your container as a geocache and with the proper contact information may reduce the chances of your cache being reported as a suspicious package.

7. **Stock the cache.** Include a letter explaining what it is, just in case a non-geocacher finds it https://www.geocaching.com/play/hide/en-us/small-note. Also, if the geocache is large enough, include a logbook, a pen or pencil and trinkets for finders to trade out. Keep cache contents family friendly and do not include food or scented items. *(Tip – Your local dollar store should have everything you need to set-up a geocache.)*

8. **Hide your cache.** Your cache is more likely to last if you choose a low traffic area where it is not likely to accidentally be discovered and where searchers won't be spotted. Please make sure your cache location doesn't damage any wildlife, public or private property.

9. **Use your GPS to obtain the coordinates.** Make sure you have a good satellite signal, and then let your GPS settle at the cache site for a minute or two before marking. Check your owners' manual for the section on how to mark a waypoint if you don't yet know.

10. **List and maintain your cache.** Units can decide if they want to post their cache on www.geocaching.com so other geocachers can obtain the coordinates. Consider maintaining your cache for the rest of the Guiding year as a service project or program requirement. Once posted, be ready to respond promptly to reported problems such as missing containers and wet or full logbooks. However, once you place a cache you don't need to maintain it forever. If you lose interest or unable to maintain it, remove your cache and archive the listing.

GEOCACHING ACTIVITIES

1. Geocaching Guessing Game

Equipment: geocoin, travel bug, logbook, pen, pencil sharpener, bison tube geocache, nano geocache container, fake rock cache, mini decon cache container, magnetic bolt cache, soda bottle tube cache, plastic ammo can, large bag, piece of paper

Instructions:
1. Place different types of geocaches and geocaching-related objects in a large bag.
2. Have each girl put her hand inside the bag and guess what objects are in the bag. She can write down each of her guesses on a piece of paper.
3. The girl with the most correct guesses wins.

2. Geocaching People Search

Instructions:
1. The girls will walk around the room and find another girl who matches the description listed in the box. When a girl collects enough names for each box to form two complete lines, that girl wins the game. The line can be horizontal, vertical or diagonal.

Find a person who has …

1. **climbed a tree for a cache**	2. **cached for 365 days in a row**	3. **found a geocoin**	4. **found less than 20 caches**	5. **was not able to find geocache she was looking for**
6. **played Pokemon Go**	7. **found a geocache**	8. **cached in more than two provinces**	9. **geocached with friends**	10. **adopted a geocache**
11. **found more than 200 geocaches**	12. **placed more than 10 geocaches**	13. **described geocaching to a muggle**	14. **gone canoeing for a cache**	15. **a geocaching app on their phone**
16. **found 50 virtual caches**	17. **found an Earth Cache**	18. **used a geocaching device**	19. **found more than 100 multi-caches**	20. **found a geocache on a bridge**

3. Geocaching Word Search

Geocaching

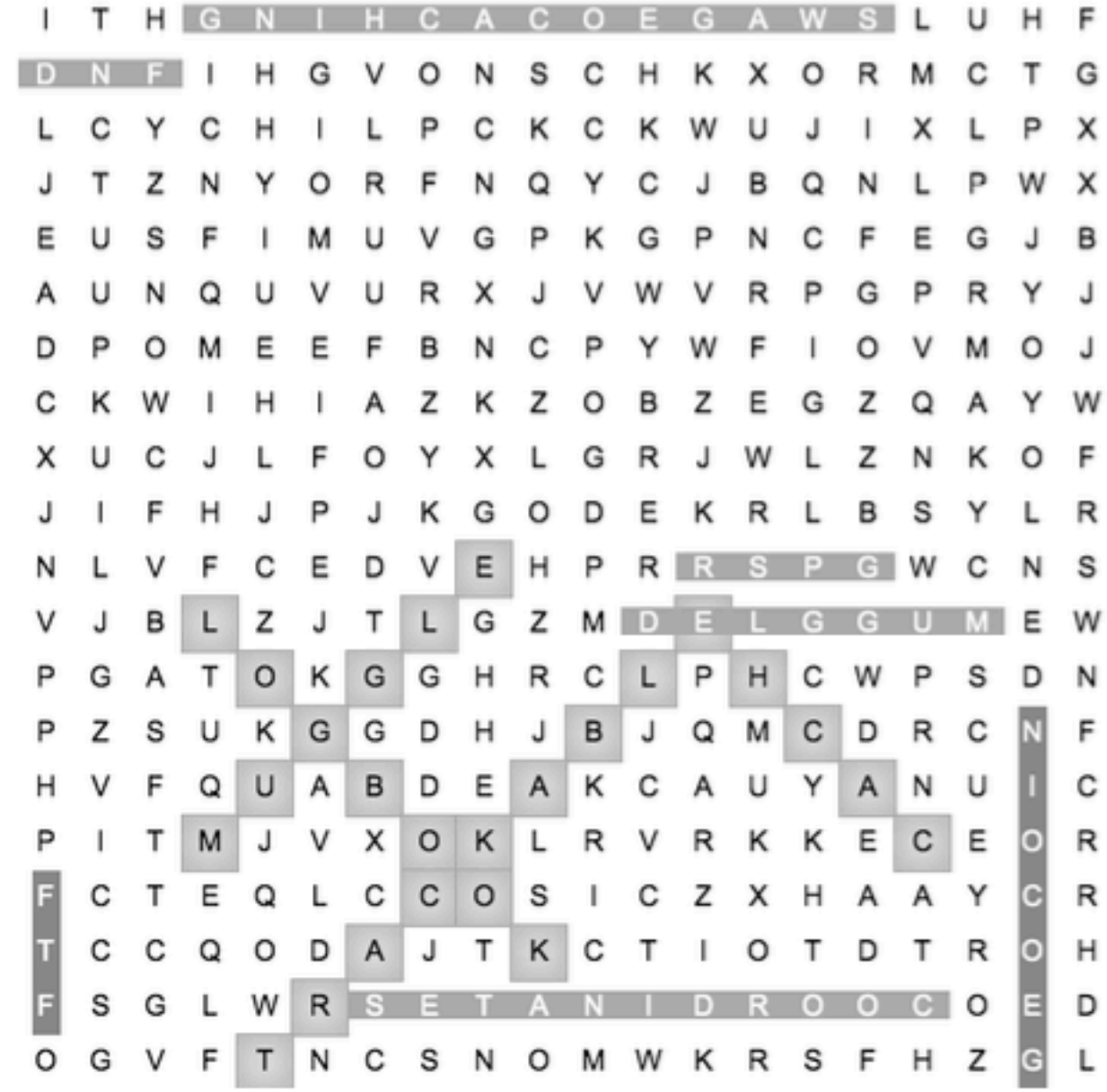
I T H G N I H C A C O E G A W S L U H F
D N F I H G V O N S C H K X O R M C T G
L C Y C H I L P C K C K W U J I X L P X
J T Z N Y O R F N Q Y C J B Q N L P W X
E U S F I M U V G P K G P N C F E G J B
A U N Q U V U R X J V W V R P G P R Y J
D P O M E E F B N C P Y W F I O V M O J
C K W I H I A Z K Z O B Z E G Z Q A Y W
X U C J L F O Y X L G R J W L Z N K O F
J I F H J P J K G O D E K R L B S Y L R
N L V F C E D V E H P R R S P G W C N S
V J B L Z J T L G Z M D E L G G U M E W
P G A T O K G G H R C L P H C W P S D N
P Z S U K G G D H J B J Q M C D R C N F
H V F Q U A B D E A K C A U Y A N U I C
P I T M J V X O K L R V R K K E C E O R
F C T E Q L C C O S I C Z X H A A Y C R
T C C Q O D A J T K C T I O T D T R O H
F S G L W R S E T A N I D R O O C O E D
O G V F T N C S N O M W K R S F H Z G L

Word List:

CACHE
COORDINATES
DNF
FTF
GEOCACHING
GEOCOIN
GPSR
LOGBOOK
MUGGLE
MUGGLED
SWAG
TRACKABLE

ANSWER KEY:

Geocaching



Word List:

CACHE
COORDINATES
DNF
FTF
GEOCACHING
GEOCOIN
GPSR
LOGBOOK
MUGGLE
MUGGLED
SWAG
TRACKABLE

GEOCACHING

Please list the coordinates of the geocache(s) (i.e. N 49° 15.317 W 123° 14.669) you found and/or created, and the Travel Bug or Geocoin number (i.e. TB18N93) that you released on the slip.

When you have fulfilled the requirements, complete the **BC Crests Order Form** found on the BC Girl Guides website (https://www.girlguides.ca/WEB/BC/). Instructions on how to order the crests are provided on the form.

Unit Name:		**Guiders Name:**	
District:		**Number of Crests:**	
Area:		**Guiders E-mail:**	
Province:		**Guiders Address:**	
Geocaches Found:			
Geocaches Created or Trackable Released:			