

*Learning Neo-Geography:*  
**Collaboratively Mapping the Community  
Space with Online Geospatial Tools**

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"How do ants regularly travel thousands of times their own body length to arrive at a pinpoint goal?"  
(Peter Morville 2007)

## General Framework for Learning

More than 80% of information we handle in our every day life has locational component. Our school, home, shopping mall, playing ground is all located somewhere on the Earth's surface. Without the knowledge of position, distance, and direction, we cannot even reach your school or return home from the school.

We often confront '*where*', '*how far*', '*which direction*' and similar other questions in our life. For examples, where is my school? Where is the shopping mall? Where is the community 'X'? Where do we construct the new school so that it serves our community the best? How far is place 'A' from place 'B'? The ability to answer these questions requires spatial thinking. This module provides a set of activities to begin such thinking.

The goals of the activities are:

- Gain a basic conception of geographic information system (GIS) and online mapping;
- Learn to use common online geo-tools such as Google Map, OpenStreetMap, and GPS;
- Develop passion necessary to go to the next level of learning;
- Develop spatially aware citizenships;

The module follows a general framework of inquiry-based learning model. It brings the learner through a five-staged learning cycle called 'inquiry cycle' as shown in Figure 1. For more details on inquiry-based model, see <http://www.....>



Figure 1: Inquiry-based geospatial learning

## ACTIVITY 1: Understanding the Geographic Position

**Requirements: Pen and paper**

Everything that you see on the Earth's surface has a position. Look outside the window of your house (or window of the bus when you are traveling) to see a variety of things that have geographic positions. Anything that has a position on Earth's surface is often called geographic object. A geographic object can be as small as a grass and as large as a whole continent.



We cannot map every geographic object. Therefore, what geographic objects we map depend on our needs and interests, which may vary from person to person or community to community. In this activity, you will identify 5-10 geographic objects that interest you. In activities 2, 3 and 4, you will measure their positions, map them using Google map, and share the maps with your friends using the Internet.

## GOING THROUGH THE LEARNING CYCLE

**Ask:** After the youth leader briefly explains the activity, participants ask themselves: what are the geographic objects of their interest?

**Investigate:** Participants go out of the room and consciously observe the real world. They identify some objects of their interest and study characteristics of these objects.

**Create:** Participants use a pen and paper to create a table with two columns. They will list the objects of their interest in the first column and the characteristics of these objects in the second column. The leader will encourage the participants to create this list in the field.

**Discuss:** Participants return to the room and look at each other's list. Each of them explains why she is interested in these objects. They will also discuss why they selectively recorded certain characteristics of the objects and ignored other characteristics.

**Reflect:** Participants think about the whole process particularly the following:

- Why are geographic positions important?



- Will my friends, families, and other members of the community be interested in the positions of the objects I am interested in?
- How can I measure and map the position of the geographic objects I am interested in and share with others?

**Glossary:** Geographic position is a location on earth's surface given with respect to a known origin and standard measurement system such as latitude/longitude or other coordinate systems.

## ACTIVITY 2: Measuring the Geographic Position with the GPS

**Requirements:** GPS receiver, pen, paper, computer, and the Internet

Technologies for measuring the position, distance, direction, and other aspects of geography have evolved with the evolution of human civilization. Our early ancestors depended on basic human senses (sight, hearing, taste, smell, and touch) for traveling and locating resources. Positions of Sun and stars, too, were used for a long period. Later, humans gradually used more advanced technologies such as rope, stick, compass, hand-drawn map, printed map and now digital devices for acquiring and using positional information.



In this activity, you will use a modern device called global positional system (GPS) and measure the positions of some of the geographic objects you have identified in Activity 1. If you are interested to understand more about GPS, see <http://en.wikipedia.org/wiki/Gps>

## GOING THROUGH THE LEARNING CYCLE

**Ask:** After the youth leader briefly explains about the basic principle of GPS, participants ask one or more of the questions: how can I use this gadget to measure the position? How does this device really work?

**Investigate:** Participants spend few minutes playing with the GPS device and familiarizing with different buttons and their functions. Because the device cannot communicate with satellites within the room, participants are advised to go out while they use the GPS.

**Create:** Participants go to the field and record the position of objects of their interest. They accomplish this by going to the 'main page' of the GPS, selecting 'mark' and then 'marking waypoint'. The participants use the pen and paper to note the waypoint numbers that correspond to different geographic objects. This is particularly important when they are measuring a large number of waypoints.

**Discuss:** Participants return to the room and share about the positions (the latitude and longitude values) they recorded as well as any difficulties they encountered.



**Reflect:** Participants think about the whole process particularly the following:

- How accurate are the recorded latitude/longitude values?
- What can be other uses of this device personally for me as well as for my community?

**Glossary:** Listen the following song to understand the numbers in latitude and longitude the GPS has recorded about your geographic objects.

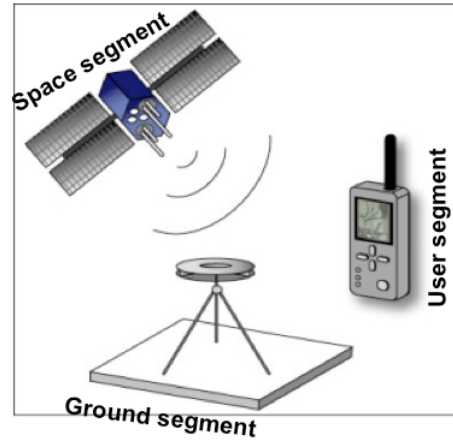
[http://makingmaps.owu.edu/blogs/long\\_lat-160.mp3](http://makingmaps.owu.edu/blogs/long_lat-160.mp3)

### ACTIVITY 3: Reaching a Geographic Position with the GPS

**Requirements:** GPS receiver, pen, and paper

In Activity 2, you used GPS to record the positions of geographic objects. GPS can also be used to calculate distance and direction to a geographic object from your current position. For example, if you know the latitude and longitude value (position) of a gold mine, GPS can calculate the distance of the mine from your current position and direct you to reach there.

In this activity, you will use GPS receiver, enter the latitude and longitude of your target, and follow the direction to reach the target. This activity is best suited when the weather is good.



### GOING THROUGH THE LEARNING CYCLE

**Ask:** After the youth leader briefly explains about the basic principle of GPS, participants ask one or more of the following questions: how can I enter the latitude and longitude of my target in this gadget? How can I use this gadget to reach my target?

**Investigate:** Participants explore the ways for entering the latitude and longitude of their target in the GPS receiver. For this, they can follow the procedure similar to the one they used for marking the waypoint. When the device is ready to mark the point, you can highlight the latitude/longitude values and replace these values with the latitude and longitude of your target. Once it is done, you may also change the name of the point. For this, you may need to play a few minutes with different buttons. Entering the latitude and longitude does not require connection to the satellites. Hence, this can be done inside the room.

**Create:** Depending upon the distance of the target, participants walk or drive to reach their target. They can see distance they need to travel as well as the direction to follow. The compass in the GPS receiver continuously guides the participant to the target, as they keep moving.



**Discuss:** Participants discuss about what they find easy or difficult in following the GPS direction.

**Reflect:** Participants think about the whole process particularly the following:

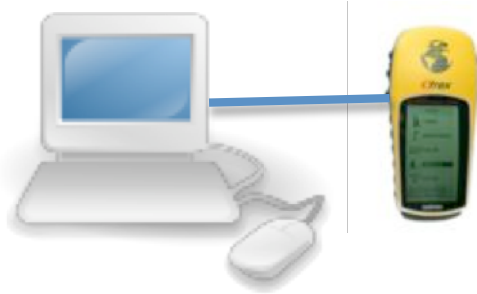
- How close did the device lead the participant to their target?
- Can I organize similar events with other members of my community?



**ACTIVITY 4: Transferring the Positional Data from GPS to the Computer**  
**Requirements: Computer, GPS receiver, GPS data transfer cable, pen, and paper**

In activities 1, 2 and 3, you went out in the field and played with the GPS. These activities should have motivated you to begin consciously observing the physical space around your home, school, community or any other places you visit.

As you have identified in activity 1, there are various kinds of geographic objects in the physical space. In activity 2, you recorded the positions of some of the objects of your interest using the GPS. Your friends and families may not know the positions of these objects. Therefore, they may love the information if you could share it with them.



In the next few activities, you will map the position of various objects and share with others. This requires that you first transfer the positional data from GPS to the computer. In this activity, you will use GPS cable and Google Earth software to transfer the latitude and longitude of your objects to the computer.

**GOING THROUGH THE LEARNING CYCLE**

**Ask:** After the youth leader provides an overview of GPS data and data transfer, participants ask one or more of the questions: why do I need to transfer the data from GPS to computer? What do I need to do for this? Which software can I use?

**Investigate:** Participants use Google search engine to explore different software for transferring GPS data to computer. They will also explore advantages and disadvantages associated with different softwares.

**Create:** Depending on the availability and ease-of-use of the software, participants will use one of the softwares and transfer data from GPS to the computer. Because you will be using Google map for mapping your positions in the subsequent activities, you will need to create files either in KML (keyhole markup language) or GeorSS (geographically encoded objects for RSS feeds) formats.



**Discuss:** Participants discuss about what worked and what did not while transferring the GPS data to the computer.

**Reflect:** Participants think about the whole process particularly the following:

- How will it work when I have a different GPS device and software?
- How can I use the GPS data if I do not have software to transfer it to the computer?



**ACTIVITY 5: Mapping and Sharing Positional Information on the Internet**  
**Requirements: Computer, Internet, GPS receiver, pen, paper, and Google account**

In activities 1, 2 and 3, you went out in the field and played with the GPS. These activities should have motivated you to begin consciously observing the physical space around your home, school, community or any other places you visit.

As you have identified in activity 1, there are various kinds of geographic objects in the physical space. Each of these objects possesses a vast amount of information. This information is useful in understanding the objects, their relationship with other objects, and our intervention in making the physical space a more livable place. It is impossible for an individual to physically visit and acquire the knowledge about all the objects of her interest. Therefore, we need to share the information with each other.



In this activity, you will begin mapping information about the geographic objects you have identified in activity 1 and share with others using Google map. One of the first tasks you need to do is transfer the position data from GPS to your computer as you have done in activity 4.

**GOING THROUGH THE LEARNING CYCLE**

**Ask:** What are the different ways to map positions? How can I map the position I have collected from the field? How can I share the information about these positions with my friends and families?

**Investigate:** The participant creates a Google account if she does not already have one. She spends some time playing with Google map and exploring its features. She also explores the different ways to map the positions of her interest. For example, she may provide the address and ask Google map to locate it on the map; she may go to the map and manually locate the position; or she may provide the positions she has collected from the field to Google map.

**Create:** The participant uses the KML or GeorSS file she created in activity 4, and imports it in Google map. Remember, your file consists of



the latitude and longitude values of the positions of your interest. The participant gives a good title for her geographic objects; provides descriptions, symbols and colors to communicate the information easily with others.

The participant then sends the map to other participants as test cases for sharing.

**Discuss:** Participants share their experience and discuss what they learned, and what was difficult or easy.

**Reflect:** Participants think about the whole process particularly the following:

- What are maps and their purposes?
- What are the elements of a good map and how can I create good maps?
- What are different ways for sharing positional information?
- What positional knowledge do I have from my neighborhood and community that may be of interest to others? How can I share this information to those interested in it?
- What other tools are there for mapping and sharing positional information?



## ACTIVITY 6: Augmenting Positional Information with Pictures

**Requirements:** Computer, Internet, pen, paper, and Google account

When pictures are used with positional information, they may provide richer information about the geographic objects. For example, if you are interested in history, you may use GPS to record the position of a museum and then use pictures to describe different facets of the museum. You can use online mapping tools to share this information and explain about the museum to your friends who may be thousands of miles away from you and the museum.



In this activity, you will work with pictures about the geographic objects of your interest. You will take pictures, upload them in one of the online picture serving sites, and use these pictures to provide a rich description of certain geographic objects or phenomena.

## GOING THROUGH THE LEARNING CYCLE

**Ask:** How can I attach pictures to position? Which tools are available for doing this? How can I share the pictures along with positional information?

**Investigate:** The participant creates a Google account if she does not already have one. She spends some time playing with Picasa (an online site that allows for uploading, organizing and sharing pictures) and exploring its features. She also explores the ways for sharing pictures on the Internet, particularly with maps.

Further, the participant spends some time investigating how to link pictures from Picasa to the map in Google map.

**Create:** The participant creates an album in Picasa and uploads pictures. She copies the link of her pictures from Picasa and then uses this link in Google map so that the user of her map can view both the position and the pictures.

**Discuss:** Participants share each other's map and discuss about their maps.

**Reflect:** Participants think about the whole process particularly the following:



- Is this a more effective way of communicating geographic information than mere positions?
- How can I use this experience to communicate and address the issues of my community?
- Can a number of people collaborate to map certain issues of my community?



### ACTIVITY 7: Augmenting Positional Information with Videos

**Requirements:** Computer, Internet, pen, paper, and YouTube account

When videos are used with positional information, they may provide an exciting set of information about the geographic objects or phenomena. For example, if you attended a live concert and wanted to share this with your friends who could not attend it, you can record the position where the concert took place with GPS and video with iFlip. Then you can map the position in Google map and attach the video to the map, and send your map to your friends. They can now view the video in the spatial context where they can zoom-in, zoom-out and pan map to explore the places around concert.



In this activity, you will work with videos about the geographic objects or phenomena of your interest. You will record videos, upload them in one of the online video sites, and use the video to provide a richer description of certain geographic objects or phenomena.

### GOING THROUGH THE LEARNING CYCLE

**Ask:** How can I attach a video to a position? Which tools are available for doing this? How can I share the videos along with positional information?

**Investigate:** The participant creates a YouTube account if she does not already have one. She spends some time playing with YouTube (an online site that allows for uploading and sharing videos) and exploring its features. She also explores the ways for sharing videos with Google maps on the Internet.

**Create:** The participant creates a video and uploads it in YouTube. She copies the link of her video from YouTube and then uses this link in Google map so that the user of her map can view both the position and the video.

**Discuss:** Participants share each other's map and discuss about their experience, particularly what they found exciting and what they did not.

**Reflect:** Participants think about the whole process particularly the following:



- Do videos augment the positional information? How?
- How can I use the experience gained in this activity to communicate and address the issues of my community?