

# Mendon Ponds Park

## Topography & Glacial Features Lab

**Introduction:** Mendon Ponds Park was named a National, Natural Landmark due to its glacial landforms that were created by 4 major glaciers, some 12,000-14,000 years ago. These glaciers were from 5,000-10,000 feet thick and reached just south of the Pennsylvania border. In addition to kames, eskers, kettles and erratics, the park also contains a very rare meromictic lake, “Devil’s Bathtub”, which has very deep water surrounded by unusually high ridges. The topography varies widely from gentle slopes to steep drop offs.

**Objectives:** In this lab, students will fortify their understanding of topographic maps, by physically hiking an area that they previously viewed on paper and experiencing first-hand the distances represented by the scale and elevation changes represented by the contour lines. Students will also learn to identify glacial features and use Global Positioning Systems (GPS) and Geographic Information Systems (GIS) technology which is an introduction into a new, dual-credit course that will be offered in the fall.

**Vocabulary:**

**Gradient:**

**Contour Line:**

**Esker:**

**Kame:**

**Kettle:**

**Erratic:**

**Drumlin:**

**Bog:**

**GIS:**

**Procedure:**

- A) Have permission slip signed and returned to your teacher.**
- 1) As a class, review the topics of topographic maps and glacial features.**
  - 2) View and discuss a map of Mendon Ponds Park.**
  - 3) Pack a lunch, and dress for the weather, ie. Boots/old shoes, old/warm clothes.**

- 4) Prior to traveling to Mendon Ponds Park, split into groups of 3 or 4, making sure one of you has a camera or smart phone that he/she is willing to bring. At least one member needs to bring the lab and a pen as well.
- 5) On the bus-ride to Mendon Ponds, Obtain one GPS unit per group and a writing utensil.
- 6) Follow the directions below to set the proper coordinate units for the lab:

## **TO CHANGE COORDINATE UNITS FROM DGREES AND MINUTES TO DEGREES WITH DECIMALS**

- Power on by pressing the power button where it says “light”
- Toggle down with the rubber button to “set up” box and click it
- Toggle down with the rubber button to the “Position Format” button and click with button
- Press again on position format
- Toggle up one space to hddd.ddddd and press rubber button
- Press the back button to main screen and the then turn off GPS by holding down the power button

- 7) Upon arrival, separate into your groups and hike the designated path, stopping at the 6 pre-determined locations.
- 8) Upon arrival at your first location, turn on the GPS unit by pushing the power button where it says "light". Push rubber joystick button on upper right of unit to the right one click to the "Where To" box. Press down on the rubber button. Toggle over to the "Coordinates" box and press again.
- 9) At each location, record the Latitude, Longitude (ALL DECIMALS!), name of the glacial feature, and clock time in the report sheet on the third page. Take a photo of the glacial feature as well. SHUT OFF THE GPS BEFORE MOVING TO NEXT LOCATION!!
- 10) The following class, watch the 14 minute video on GIS Tech. here: <https://www.youtube.com/watch?v=poMGRbfgp38>
- 11) After a brief discussion, input your site letters, Lat., Long., and feature data into "Notepad" following the instructions on the next page:

# INPUTTING DATA INTO NOTEPAD INSTRUCTIONS

Go To The Bottom Left On Your Computer Screen and Click on the Windows Icon

Type “Notepad”

Click on Notepad

To create document:

Type in the following into Line 1:

site,lat,long,feature      **NO SPACES, USE COMMAS!!**

Type in Line 2-6 your data from the field:

Ex. a,43.027849,-77.56899,drumlin      **USE NEGATIVE FOR LONG**

Once completed, go to “Save As”

Save to Thumb Drive and/or student account

Select “All Files”

File name should read: gps\_(your name).csv

Save

# Mendon Ponds Report Sheet

Site Letter   Latitude   Longitude   Feature   Photo ✓   Time   Elevation (ft)   Distance (mi)

A							NA
B							A-B
C							B-C
D							C-D
E							D-E
F							E-F
						Total Time	F-A
							<b>Total</b>

**Procedures Continued:**

- 12) Obtain and turn on a laptop computer and follow the information below to import your data to the digital map of Mendon Ponds Park.

Go to:

<http://arcg.is/1WRg2Zt>

Click on **Modify map** (upper right)

Click on **Add** (top left)

Click on **Add Layer From File**

Click **Browse** Box

Select your data file that you created in step 8 above.

Click **Import**

Your 6 data points should now appear on the digital map. If they do not, carefully review the procedures, making sure you followed them to the letter. If you can't figure out your mistake, ask your teacher for help.

- 13) Left click on each point to see the corresponding glacial feature that we visited in that area.**
  
- 14) Zoom in and/or out to estimate and record the elevation of each of the 6 visited points in FEET on the report sheet. Use the contour lines for this info.**
  
- 15) Measure the distance in miles between each point by clicking on the measuring tool, clicking once on the point that you want to start at, dragging it to the point that you want to finish at and double clicking. Record the distance between each point on the report sheet and then draw the entire distance of the route and record.**
  
- 16) On the report sheet calculate the total amount of time it took for your hike in hours and record it in the space provided.**
  
- 17) Print your map with the 6 points and measured route so that each group member has a copy.**



**Discussion Questions:**

- 1) **What erosional agent is most responsible for the features now visible in Mendon Ponds Park?**
  
- 2) **What was the average speed (rate of change) that we walked from start to finish (“A” back to “A”) of our hike?  
(Total Distance / Total Time) Calculate your answer in mph [show work]**
  
- 3) **What is the slope (Gradient) between points “A” and “B”? [show work]**
  
- 4) **Does the water in the area flow Northward from Quaker Pond to Hundred Acre Pond or vice versa? How do you know?**

5) Go to the Mendon Ponds digital map where you plotted your points (<http://arcg.is/1WRg2Zt>) and click on “Basemap” in the upper left-hand corner. Click on and view the 11 map types other than “Topography” which you are now on. **Choose 1** of these basemaps and describe (a) what it shows, (b) how it’s different from the topography map, and (c) what you thought was interesting about it. Zoom in and out to see the differences.

(a) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(b) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(c) \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Extra Credit Option:** Dig deeper into the GIS program and find a way to import your photographs of the 6 glacial features to the corresponding points on the digital map. Show me when you have this accomplished and I’ll sign off on it. Good Luck!

