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GPS to Determine Longitude and Latitude

Joann Bell
The College at Brockport

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Joann M. Bell

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CMST

Lesson Plan

GPS

Grade level: 8

Math Objective: Students will understand the importance of order when graphing coordinate points.

Soc. Studies Objective: Students will use GPS unit to determine location and will be relate location with coordinate graphs.

Technology Objective: Students will be able to use the GPS mobile unit to determine longitude and latitude

Materials: GPS mobile unit
Graphing calculator
Graph paper
Portable laptops

Math Standards: [HYPERLINK http://www.emsc.nysed.gov/3-8](http://www.emsc.nysed.gov/3-8)

8.PS.11 Work in collaboration with others to solve problems

8.RP.2 Use mathematical strategies to reach a conclusion

8.CM.3 Organize and accurately label work

8.R.8 Use representation as a tool for exploring and understanding mathematical ideas

Essential Question: Why is order important when we gather data?

Launch: How do locate Madrid on a map? What about Rochester?
Is there a relationship between locating points on a map and coordinate graphing?

Work: Students will work on a handout practicing longitude and latitude to locate points. Students will share their answers using the ELMO. Teacher will lead a discussion and scribe on large paper facts about longitude and latitude.

Students will be given a 2 points to locate on a large coordinate graph posted in the room. The points will be the reverse of one another. Students will be asked to compare their points and discus plotting coordinate points on a graph. Teacher will scribe comments on large paper.

Students will be given GPS units already set by the teacher. The teacher will take the students to the front walk of the school and instruct them on how to find their location using them. Each group will note the longitude and latitude and write it down. (Students will be allowed to note a few other key points in the area for practice.)

Upon returning to the classroom, the students will use their laptops to open ARGIS and ARCmap.

Students will enter the information about the location of the front door as text in the notebook. Teacher will instruct the use of the x,y, attribute header. Students will save this data.

Teacher will purposely enter some student data in her notebook backward.

Teacher will guide students using SmartBoard as they overlay a map of the area on their points.

Students will discuss what they have in front of them and what the teacher has.

Teacher will enter the correct points and color code them differently.

Class will discuss the difference.

Summary: Teacher will use questioning to elicit the important fact that order is important when entering data on maps and on graphs. Students should also note similarities and differences in graphing coordinates and in locating points on a map using longitude and latitude.

Assessment:

Quiz: Students will be asked to create a Venn Diagram (compare and contrast) of geographic mapping vs. coordinate graphing

Rubric for task

Student evaluation of the task. (Frayer)

Homework: Word problems of applications of average rate

Rating Task	5 Completed the task	4 Completed most of the task.	3 Completed some of the task.	2 Completed very little of the task.	1 Did not understand the task.	0 No attempt.
Using GPS	Understands how to use and when and why to use the system and helps others	Understands how to use the system and its usefulness	Shows some understanding of how to use the systems and its usefulness	Shows little or no understanding of GPS but does understand basic mapping skills	Understands basic mapping skills.	No attempt.
Assistance	Required no teacher assistance.	Required very little teacher assistance.	Required teacher assistance 25% of the time spent on task.	Required teacher assistance 50% of the time spent on task.	Required teacher assistance 75% of the time spent on task.	Required constant teacher redirection and assistance.
Participation	Student remained on task throughout the class.	Student remained on task for most of the class.	Student was on task less than half the class but did ask questions.	Student was on task less than half the class.	Student was not on task most of the class and did not ask questions.	No attempt to work.
Mathematics	Graphs are correct more than 95% of the time.	Graphs are correct 85% to 95% of the time.	Graphs are correct 75 to 85% of the time.	Graphs are correct 65 to 75% of the time.	Graphs are correct less than 50% of the time.	Little or no attempt to show computations.