

## GPS Lesson Plan

Name: Neil Paul II – Understanding Data

Grade level(s)/Subject taught: Living Environment (10<sup>th</sup> grade)

### Objectives:

- Students will be capable of using a mobile GPS unit to plot latitude and longitude coordinates.
- Students will grasp the basic of orienteering with their GPS unit .
- Students will capable of applying the importance of GPS to real life scenarios.

### Scientific Concept:

- Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seeks answers, and develop solutions.

### Materials:

GPS units, paper, and pens/pencils.

Over the past few days the students were introduced to concepts of latitude and longitude. Their lessons, up to this point were centered around the use of globes/maps to improve their understandings of the concepts and terminology surrounding global positioning. As for the technology surrounding the topic of GPS, its was discussed briefly at the conclusion of yesterday's class. However, the discussion did not include any application, rather just a slight overview of the technology. This all being stated, the class would start with a note on the board, "Be sure to have your coats and notebooks"... something which was told to them at the end of last class. As always, the notion of getting to learn outside will win most of them over. Once outside, the instructor will lead a small discussion intended to revive their understanding of the past days' material. At the end of this discussion (5 minutes), the teacher will distribute the GPS devices and then cover the basic skills needed to use the devices (menus, compass, contrast, how to read data, etc.). The devices will be handed out to prearranged pairs of students, so that each student could assist each other, while the instructor assisted the most frazzled groups. To insure that the students were using their units correctly he/she would have them take readings as a group in prearranged areas. As the groups began to feel more comfortable the instructor would begin to discuss their assignment. Each group, although not

mentioned, was given a folder when they picked up their GPS unit at the start of the lesson. At this point they would be instructed to open it. Inside the envelope would be two exercises. The first would be a list of landmarks found around campus. Left blank on the sheet would be the coordinates of these areas. It will be the job of the groups to locate and record these landmarks using their GPS systems. However each group's landmarks would be slightly different to decrease copying. The instructor would then inform the groups of the procedure of handing in the material. If a group at any point felt that they had completed the task, they would have their markings checked by the instructor. If the recordings were 80% accurate they would be moved on to the next assignment. If not they would lose some points and be asked to reconfigure/retest their data. The second assignment would consist of a list of coordinates, however no description of the landmark. It would be the job of the group to find these coordinates and then record where they were. This portion of the assignment would be graded differently though. The second portion would be timed. Each groups time would start when they handed in part one, thus insuring that all groups had comparable amount of time to become comfortable with the technology. The hope by introducing the time aspect is that it will spur on some motivation. The groups will undoubtedly want to compete with each other, which is good, but to wane this emphasis of you versus me some, the instructor will have a class goal. This way the students would be inclined to help each other. For example if the class as a whole has an average time of X and an average percent Y correct, no one will get homework tomorrow. Once all of these guidelines were discussed the assignments would ensue as described above. As the exercise ran the instructors would supervise and assist where necessary. As groups began to finish, the finished groups would be allowed to assist the remaining groups. Then as the class started to end (last ten minutes) the instructor would ask the students for input on the assignment, in order to check for final understanding. Now as for homework the students would be asked to review their answers with those on their answer key, so that they could continue this lesson tomorrow.(percent error, average location, etc.) The hope of this lesson is to have students not only understand the basic concepts of longitude and latitude but to one day be capable of inputting/analyzing data that has been collected for it.

Score	Accuracy (Part 1)	Accuracy (Part 2)	Time (Part 2)
	- a straight score based on percent correct here... granted a minus five percent for each time it is handed in below 80% correct	- a straight score based on how many of the locations are correct... no resubmissions	-this aspect of the grade will be derived from the average class time... when this is figured out the instructor will use it as a multiplier on the raw score from part 2 accuracy