**Instructional Days:** 18-21

**Topic Description**: Students work on final unit project.

**Objectives**:

The students will be able to:

* Incorporate all unit objectives into the final project.

**Outline of the Lesson:**

* Explanation of final project (15 minutes)
* Completion of final projects (150 minutes)
* Presentations of final projects (55 minutes)

**Student Activities:**

* Groups work on final projects.
* Groups present final projects.

**Teaching/Learning Strategies**:

* Complete Muddy City activity if necessary.
* Explanation of final project
  + Distribute final project explanation.
  + Note: You may wish to modify the scenario of the problem to address student interests and abilities. Another possible example might be a variation on finding the cheapest route between locations based on the price of gasoline. This could be in the context of a family vacation, carpool routes, running errands, etc.
  + Divide students into groups of 3-4.
* Completion of final projects
  + Monitor student work, answering questions as necessary.
* Presentations of final projects
  + Have each group present the information in their final project.
  + Groups respond to questions from other students and teacher.

**Resources**:

* Mapping website such maps.yahoo.com
* Final Project (This project is adapted from MathmaniaCS Lesson 13 (http://www.mathmaniacs.org/lessons )
* Final Project Sample Rubric

**Final Project**

For this project you will use the data you have been collecting about your activities after school. Each group member should determine the day on which they visited the most locations after school and what those locations were.

Scenario:

Assume that for one day you need to carpool with the other members of the group in order to get to all of the locations you each identified on the day you visited the most different locations. Determine the shortest route in terms of miles and then determine the shortest route in terms of time. Are these the same? Why or why not? What other conditions might you want to consider? (Your data may give you some ideas.)

You will need to use a map in order to calculate the distances. The data you collected has the times. Your presentation can be given as a poster, a PowerPoint, a video or other pre-approved product.

Your presentation should include:

* The names of people in your group
* A picture (graph) or other way of representing all the locations with all roads between them labelled with mileages and times
* A detailed plan of your solution
* A written explanation of the strategies you used to find the shortest route
* The solution on the graph and the total number of miles
* A written explanation of the strategies you used to find the least amount of time
* The solution on the graph and the total time
* Why the shortest routes are the same or why not
* Other conditions you might want to consider and what data gave you the idea

**Final Project Sample Rubric**

Group Members Names: (up to 4)

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| --- | --- | --- | --- | --- |
| **Do you have?** | **Points Possible** | **Yes** | **No** | **Points Earned** |
| **Detailed Plans** |  |  |  |  |
| Overall plan to solve the problem (Explanation of strategies) | 10 |  |  |  |
| Data Journal for each group member | 20 |  |  |  |
|  |  |  |  |  |
| **Other parts of your project** |  |  |  |  |
| Graph labelled with locations and mileage | 10 |  |  |  |
| Graph labelled with times | 5 |  |  |  |
| Solution labelled on graph | 15 |  |  |  |
| Total mileage and total time | 10 |  |  |  |
| Other conditions to consider | 10 |  |  |  |
|  |  |  |  |  |
| **Presentation** |  |  |  |  |
| All group members participate | 5 |  |  |  |
| Present all parts of the project | 10 |  |  |  |
| Answer questions from audience | 5 |  |  |  |
|  |  |  |  |  |
| **Total:** | 100 |  |  |  |