UNIT 2

Lesson Final Project: Carpooling

Overview

Students are assigned groups of 3 and will select six of the locations from the data that they have been collecting. They will chose an algorithm for minimum spanning tree from the three we worked with and then present to the class their findings.

Lesson Summary

- Summary: Students pick 6 locations and the school, find distances between all pairs, then apply a minimal spanning algorithm to determine the path. Students then present their findings. Note: Prior to this students have been collecting data, and have looked at 3 different algorithms for minimal spanning trees (NCTM Illuminations)
- 1. Group students using whatever method you feel best. Groups of three work best.
- 2. The groups then look at their data and pick six locations different than the school. Groups that did not do gather data, lost theirs or forgot it, used data from my movements. Mine had 8 spots plus school which gave them more work to do.
- 3. Students then calculate distances between all pairs of destinations using MapQuest or some similar program
- 4. After organizing the data, students choose which algorithm they wish to use, use it and put together a presentation
- 5. Presentation included what algorithm they chose and why and a brief sample of how it generated the results.

CS Content

The CS content in this lesson included

- Problem solving process
- Algorithmic Thinking and application
- Elements of Graph Theory and Networking

Objectives

Students will be able to:

- Use problem solving to complete a project
- Use an algorithm to complete a task
- Create and deliver a presentation
- Work with colleagues and check work for reasonableness

Materials and Prep

- Internet Access
- Student Homework or a list of locations
- Materials for presentations
- Prep including NCTM Illuminations Minimal Spanning tree exercises

Resources

Student Documents

- Student Created documents
- Samples are included

Assessments

- Presentations
- Student Reflections

Notes

Things I will do differently next time:

1. Teams will pick two of the algorithms to perform. They will then compare and contrast these in the presentations.
2. Students should show their best route on a map rather than just on a mathematical graph.

The lesson went okay but it was clear that many groups just picked the first algorithm and ran roughly through it. We had a running theme of graph theory and

networking throughout the unit. This helped when we got to this project.