

## Reflection on the Final Project

I chose to focus on trigonometry using Geometer's Sketchpad for my final project for several reasons. In previous courses and in my student teaching experience, I had not created explorations on trigonometry; this would provide me an opportunity to do so. Also, I will be presenting my own students with these concepts next year and by creating this resource package I have cut down on some of my future work creating exploratory activities. I decided to use GSP because it gives students the opportunity to make conjectures based on appearances and measurement and then allows students to investigate these conjectures dynamically. GSP also allows for integration across the mathematics curriculum by incorporating algebraic and geometric ideas through multiple representations. In the course of my journey through the mathematics education department, I have become addicted to GSP and plan on using it regularly in my classroom for both student exploration and for demonstration purposes during instruction.

In looking at through some textbooks, I discovered that trigonometric concepts are presented in many different orders. Rather than follow an outline, I simply started at the beginning and worked through some ideas that I thought were important for students to understand. As a result, the materials provided in my final project do not stand alone as a unit for study. I chose to focus on important concepts, rather than applications because it is more difficult to fake an understanding of a concept; often students will blindly use algorithms when applying a concept and by focusing on only the underlying concepts I think the applications will be more clearly understood. The resources are explorations intended to enhance student understanding of trigonometric concepts through manipulation, conjecture, justification, and connections across the mathematics curriculum. By utilizing these exploratory tasks, students will appreciate the concepts more because they will understand where they come from. I can recall being frustrated with trigonometry because the connection to similar triangles was not emphasized in my high school courses. I think that the files I have created highlight that connection and will make the topics outlined in the curriculum more accessible to students.

In general, the sketches were easy to create because I sat down and explored some of what I know about trigonometry. I then began creating the student procedures and did the lesson plans and overview last. In a sense, I approached this project from a backward design point of view. I first found what I thought was important and interesting (by creating the sketch); then, I thought about how I knew it and what questions needed to be asked for students to know it (by creating the student procedures). The last thing I did was figure out how it would fit into the class (the lesson outline) and into the curriculum (GPS). The backward design approach worked well and it makes much more sense than creating the lessons first. The procedures were the hardest part of the project for me because they required me to put appropriate questions down on paper surrounded by sufficient instruction. For a classroom full of students with which I am not familiar, it is difficult to know what sufficient is. In retrospect, I think the activities are best suited for instructors who are comfortable with modifying the procedure to allow for the maximum student mental stretching.

I made a surprising discovery when I was incorporating the GPS into my lessons. There is no mention of triangle similarity in the Math IV standards. The similarity aspect

of trigonometry is only referred to in Math II and then students are introduced to the unit circle. With at least a year separating the two standards, I am surprised that there was no mention of connecting the two ideas in the integrated curriculum.

I have found, through student teaching, that students thoroughly enjoy lessons that include technology of any kind. I think technology is great for instructors because it allows for mathematics to be done in fresh ways that would not have been possible without it. The collection of resources I created for the GSP explorations took a lot of time, but I believe that they are worthwhile. I plan on using technology frequently in my classroom and this project provided me with an opportunity to practice planning for technology based lessons.