

Introduction

Courses: Honors Trigonometry/Pre-Calculus and Trigonometry
Grade Levels: 10-12

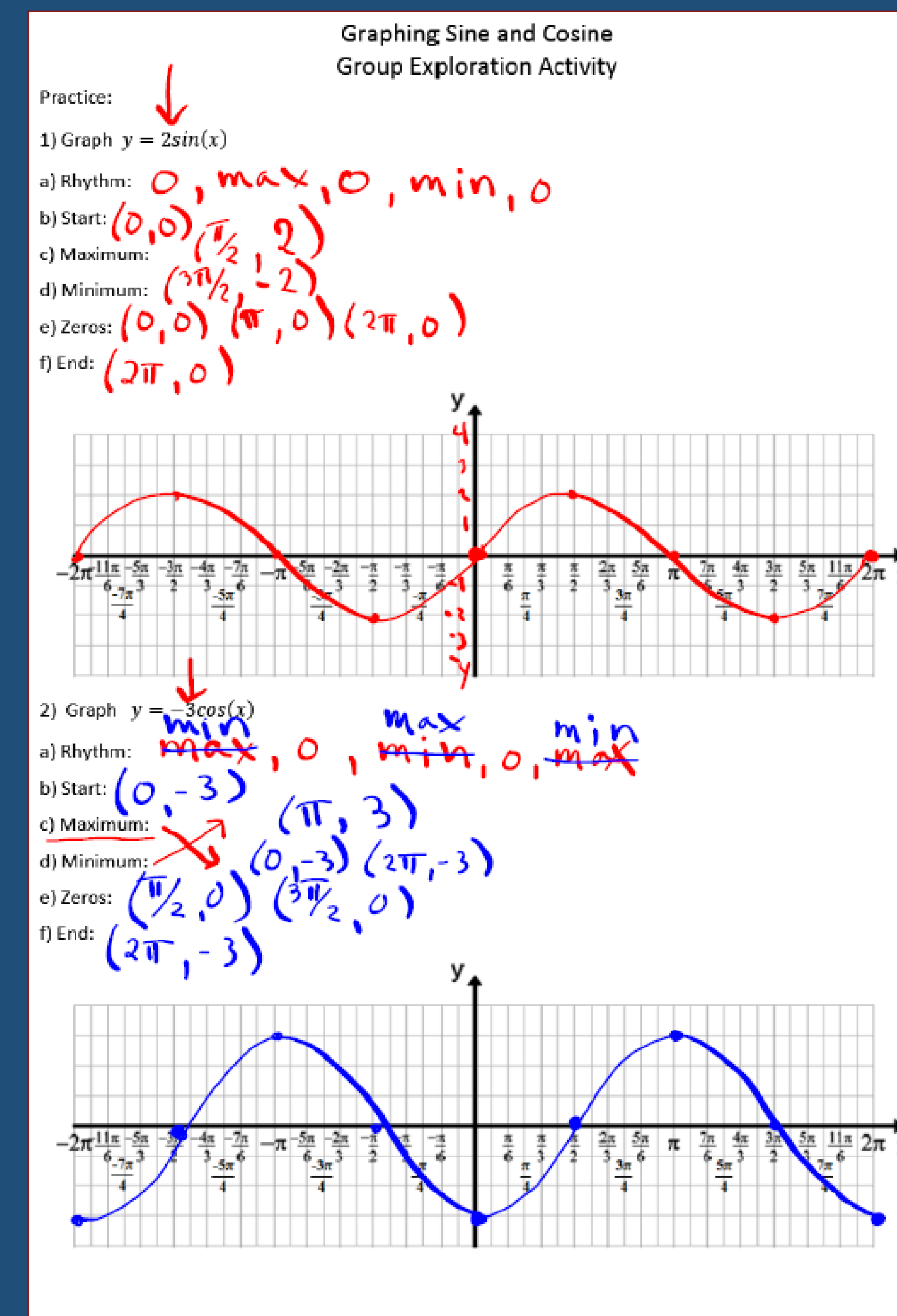
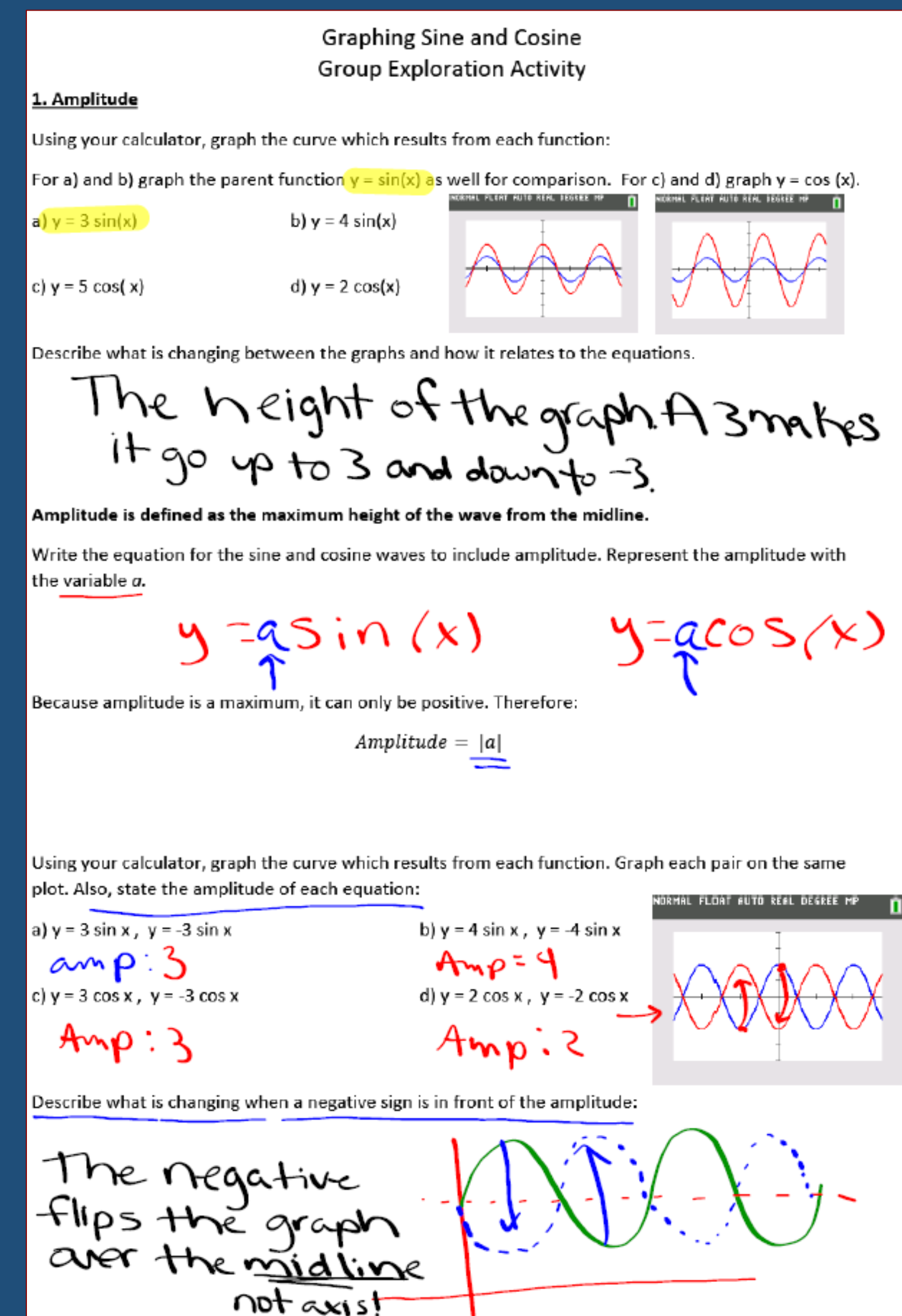
Graphing Sine and Cosine:

- Guided discovery based lesson on graphing sine and cosine functions and how we can manipulate a graph based on changes to the equation
- Explored the basic sine and cosine functions, as well as amplitude, frequency, period, and horizontal and vertical shifts
- Students learned how to generate a graph from a given equation and to generate an equation from a given graph
- Goal: To allow students to make observations on the changes occurring and to formulate statements on what they observed before being told what is occurring

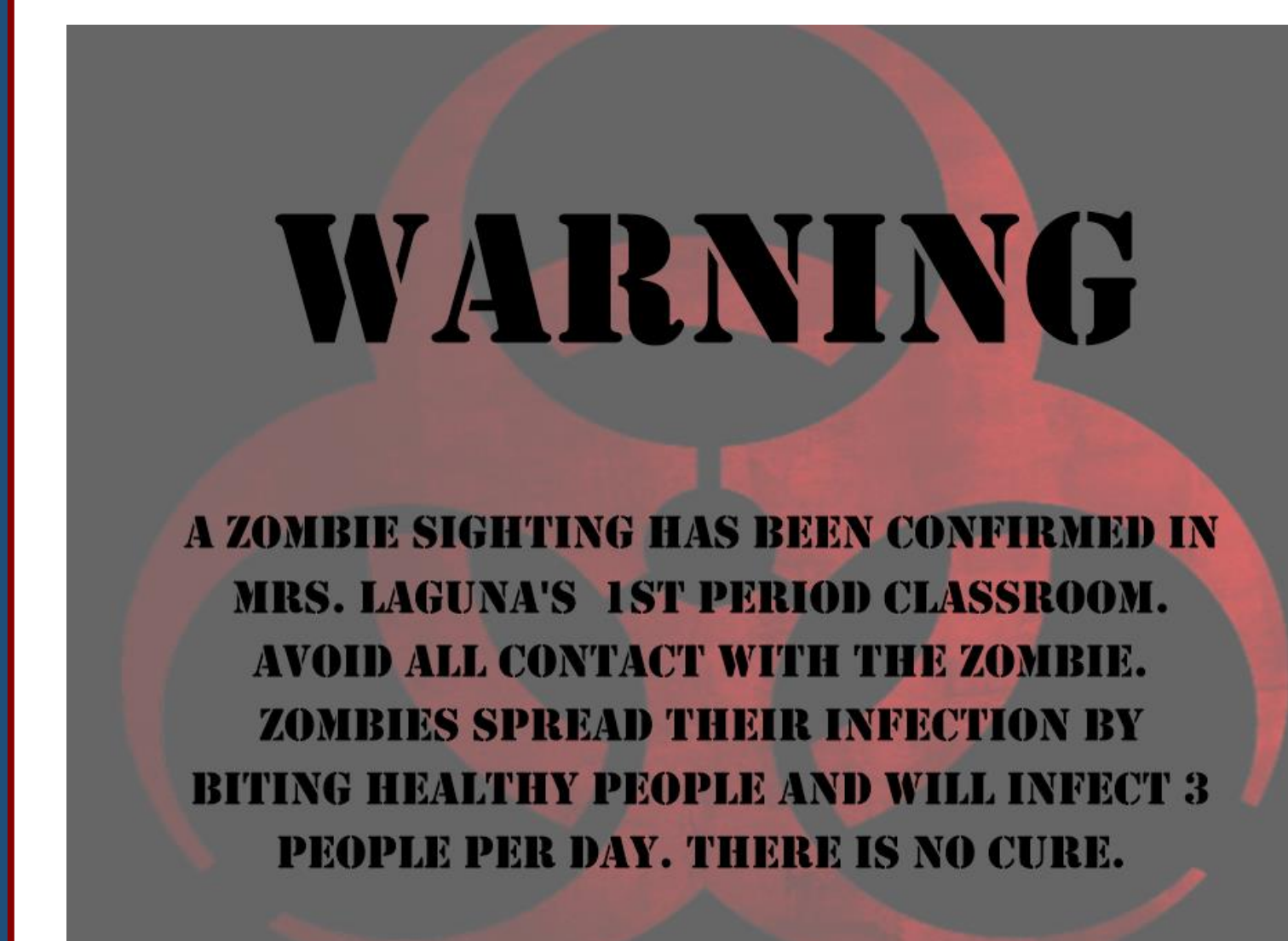
Zombies and Exponentials:

- Activity demonstrating a “relevant” use of exponential functions
- Students learned a basic model of population growth given a description of how the disease spread
- Task was to use the model to solve for different variables representing number of zombies, days of growth, and growth rate
- We used this activity to introduce solving for a variable in an exponent

Graphing Sine and Cosine



Zombies and Exponentials

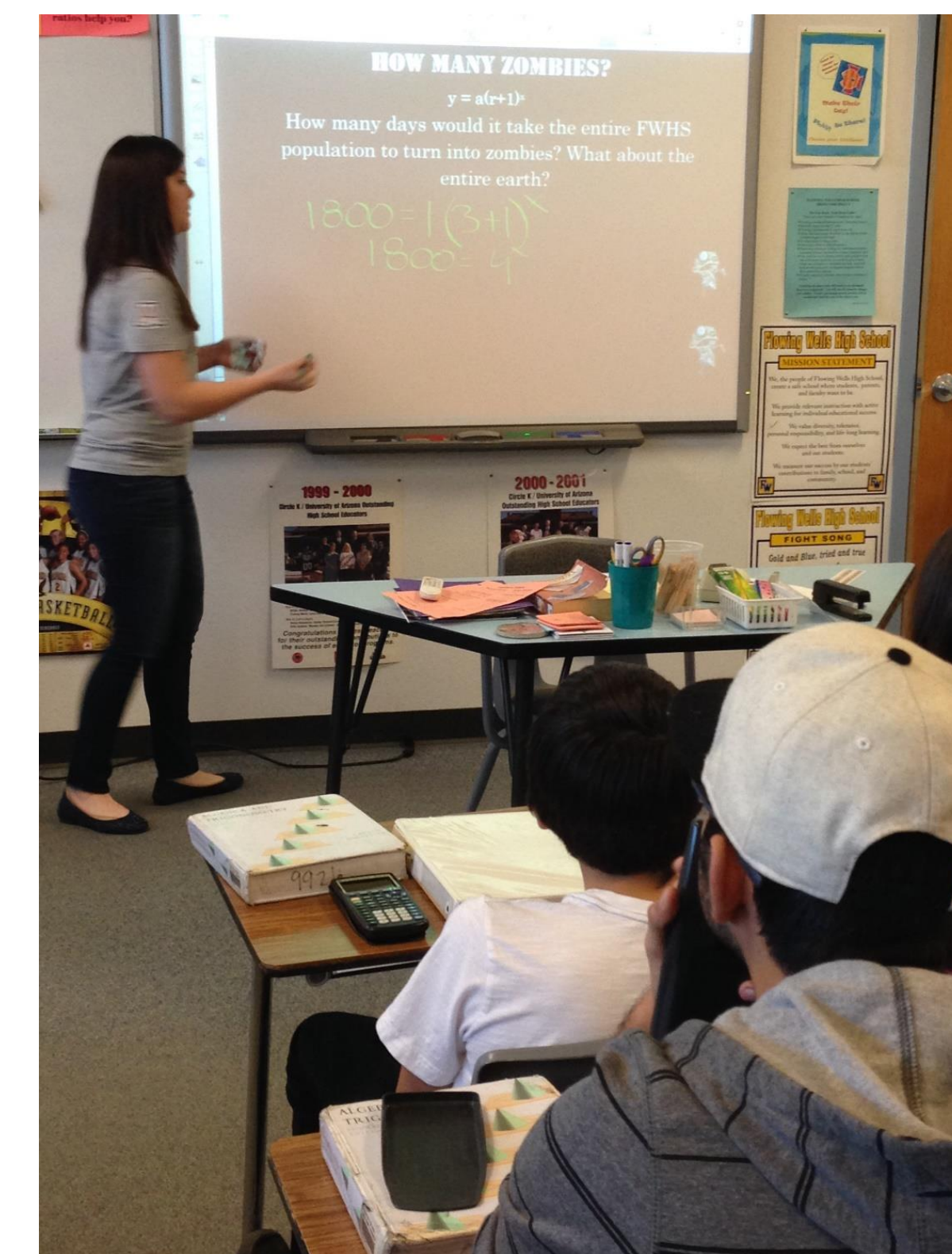


HOW MANY ZOMBIES?

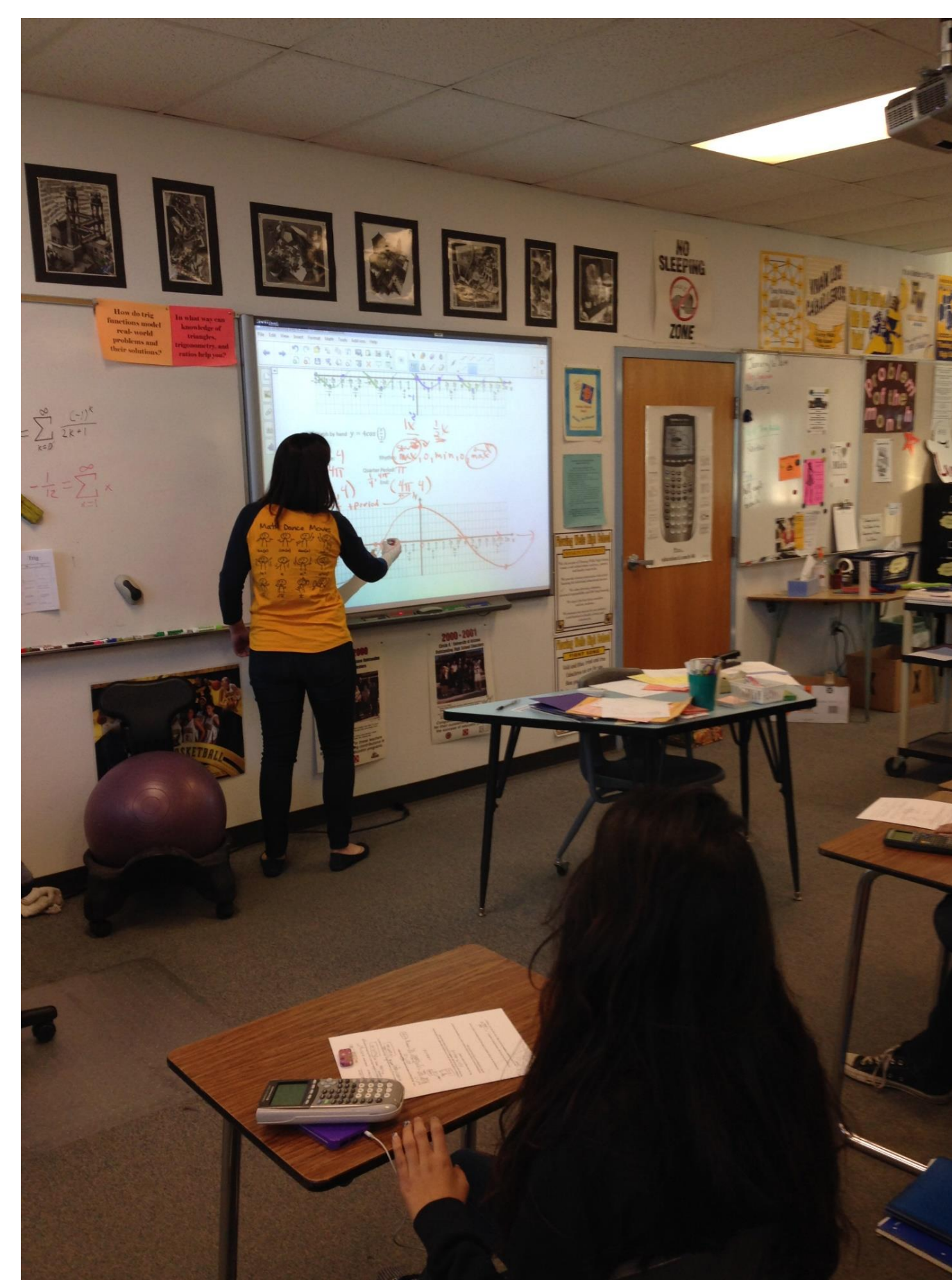
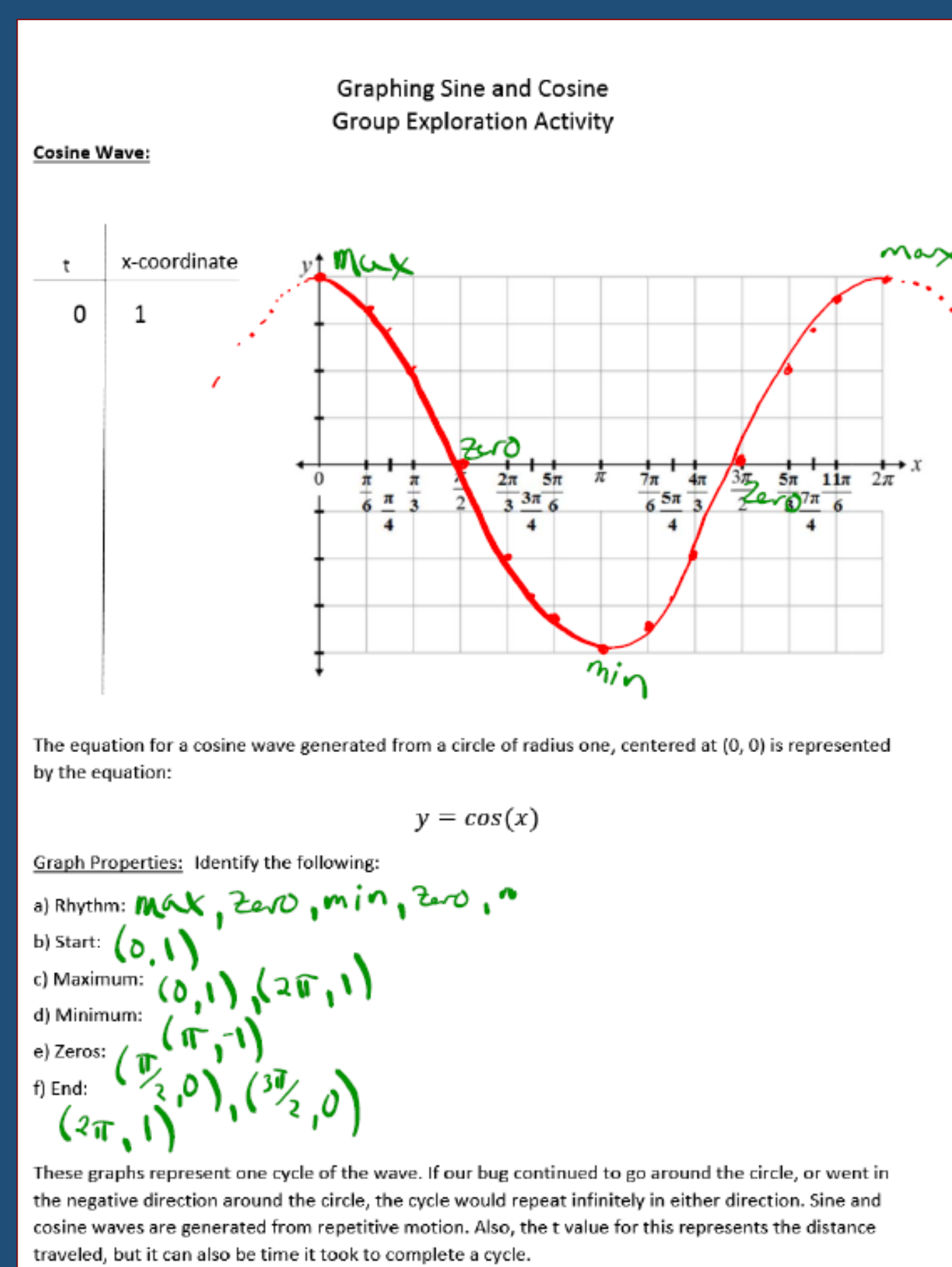
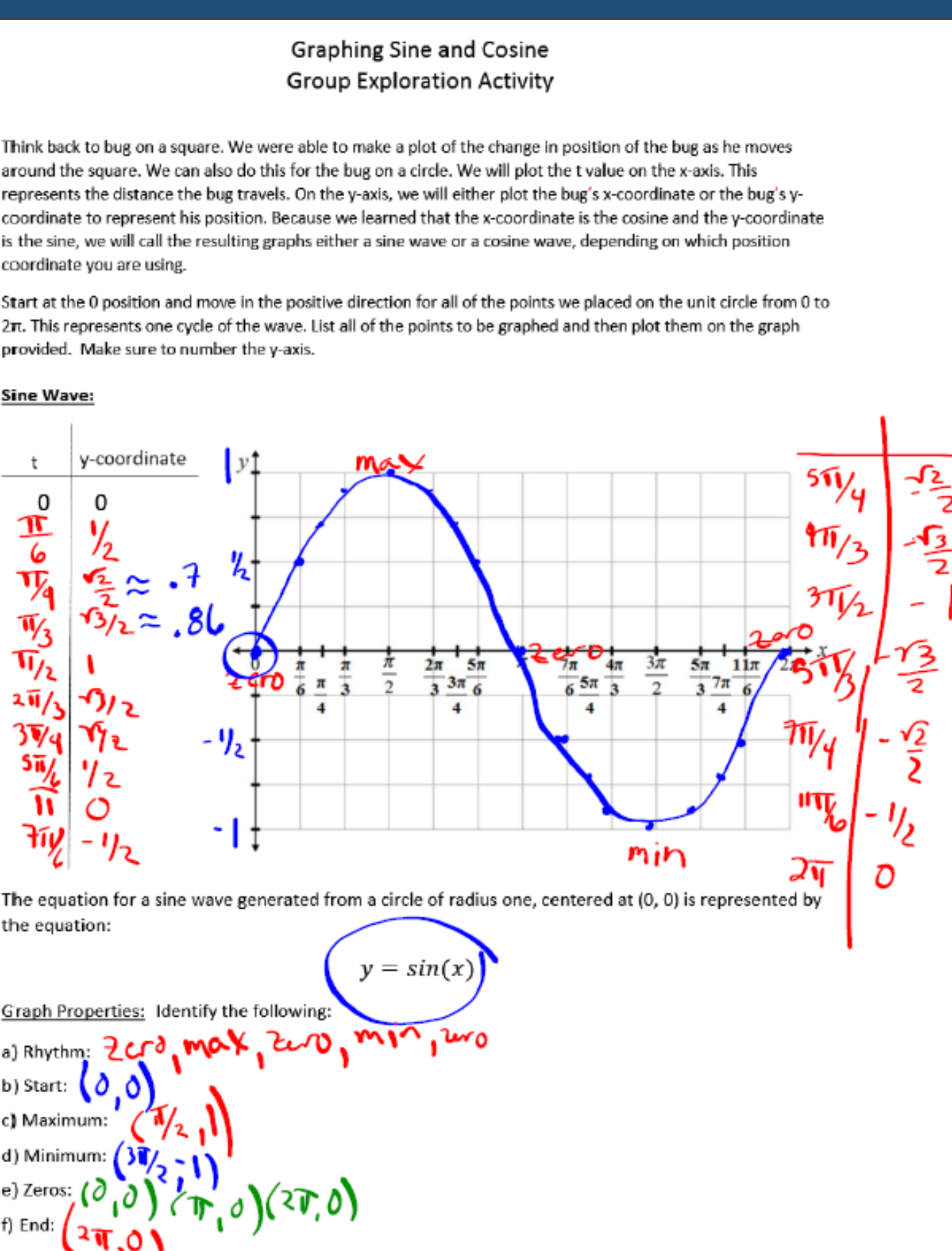
We can model the growth of the zombie population using an equation for exponential growth!

$$y = a(r+1)^x$$

Where : y = the number of zombies
 a = the initial number of zombies
 r = growth rate
 x = time interval



Graphing Sine and Cosine



Outcomes:

- Students gained more exposure to graphing than previous methods
- Students gained an understanding of what the values mean instead of only how to find them
- Students gained experience in recognizing patterns and using those patterns to predict future occurrences

Outcomes:

- Students enjoyed using the math they learned in a relevant example that is meaningful to them
- Students gained prospective on the true nature of exponential growth
- A relevant example was used to demonstrate the use of solving for variables in an exponent

Conclusions

- We designed a guided discovery based lesson for learning the principles of graphing sine and cosine functions
 - Students enjoyed the activity, but seemed to have the same struggles with the subject as previous years
- We designed an interactive activity to explain the value of exponential modeling with relevancy to disease spread
 - The activity will be expanded in the future for use in teaching linear programming

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