Lesson: Slopes and Equations of Lines

Unit: Perpendicular and Parallel Lines

1. Benchmark/Standard:
   1. [CCSS.Math.Content.HSG-GPE.B.5](http://www.corestandards.org/Math/Content/HSG/GPE/B/5) Prove the slope criteria for parallel and perpendicular lines and use them to solve geometric problems (e.g., find the equation of a line parallel or perpendicular to a given line that passes through a given point).
2. Behavioral Objectives: After this lesson, students will be able to find the equations of parallel and perpendicular lines given two points, or given the slope and the y-intercept.
3. Anticipatory Set
   1. Review on white boards finding equations of lines if given slope and a point, or if given two points.
4. Objective/Purpose:
   1. Today, we will be working on analyzing equations with different slopes to determine which lines will graph as parallel, perpendicular, or neither. Students will take a quiz to test their knowledge of this material and then begin working on finding the shortest distance between a point and a line or two parallel lines.
5. Input
   1. Task Analysis:
      1. The learner should be able to determine the equation of a line given two points and use this knowledge to determine another line parallel or perpendicular to the original line.
   2. Thinking Levels:
      1. Comprehension- Students will understand that slope is found by dividing the rise by the run on the graph.
      2. Analysis- Students will show their knowledge of truth values through the use of whiteboards, discussion at their tables, and their ability to accurately complete their quiz.
   3. Learning Styles
      1. Interpersonal: Students will be working as a whole class and will be able to have guided learning time in a relaxed manner.
      2. Remediation: Students will be given a quiz that has scrambled questioning and answers so no students can look off of each other. A print copy will be available for students with computers that are not working.
      3. Visual: Students will be shown an example of how to find these given slopes on the whiteboard.
   4. Methods and Meanings
      1. Ways of presenting: We will be having a review activity involving immediate assessment through whiteboards. A class discussion will follow. Students will also have time to be in small groups to discuss their thoughts on a small scale. After, students will have individual work time on their quizzes and homework video.
      2. Materials needed: white board, computers, whiteboard markers, pencils, paper.
6. Modeling
   1. We will use the white board to display the warm-up problems of the day. Students will use individual whiteboards to show their comprehension. As a class we will write up the correct statements on the front board.
7. Checking for understanding
   1. How do you find the slope of a line given two points?
   2. What is the point slope form equation?
   3. What is the point-intercept form equation?
   4. What is the slope of a line parallel to a given line? What else must be given?
   5. What is the slope of a line perpendicular to a given line? What else must be given?
8. Guided Practice
   1. Students will engage in a class discussion at the start of class using whiteboards.
   2. Model to students how to determine the slope of various lines.
   3. Students will work on their warm-up problems at the table with some guidance.
   4. Teacher will circulate to answer questions and help extinguish any confusion.
9. Independent Practice
   1. Students will work on their Chapter 3 quiz.
   2. Students will complete the homework, (watching 3-6 video), and answer the given focus questions.
10. Closure
    1. Evaluate the effectiveness of the lesson based on the students’ success with the quiz scores and how well they did with the whiteboard review activity.
    2. Reflect on what worked and what can be changed and do so for the following day.