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| Date: | | | Duration of Lesson: 50 minutes | |
| Title of Unit: Linear Equations: Slope and Equations of Lines | | | Title of Lesson: The Slope of a Non-vertical Line | |
| Lesson Objectives: Students will determine the slope of a line and use slope to understand graphs. | | | | |
| Groupings (e.g., whole class, small groups, co-teaching): Whole class, partners | | | | |
| Skills & Standards:  Finding unit rate, graphing proportional relationships  [CCSS.MATH.CONTENT.8.EE.B.5](http://www.corestandards.org/Math/Content/8/EE/B/5/) Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.  [CCSS.MATH.CONTENT.8.EE.B.6](http://www.corestandards.org/Math/Content/8/EE/B/6/) Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b. | | | | |
| **Progression of Learning & Teaching** | | | | |
| Opener: | * Bellringer- I will use the bellringer to review unit rate. * Discussion Post- I will give the students time to find something that would represent slope to them. Students will post individually and then we will discuss. | | | **Points to Remember** |
| Activities & Tasks: | **Instructional Lesson: *(include as much detail as needed for others to understand the lesson)***   * Student: I will ask students to find something (either a definition or a picture) that would represent slope. * I Do: I will show the [Slope Dude video](https://www.youtube.com/watch?v=ZcSrJPiQvHQ) and review the 4 types of slope. I will work a few problems to model for the students. * Y’all Do (students share with a partner or a table)   + Students will work with a partner and compare the steepness of a few graphs. * You Do: We will talk about how they could tell which slope was steeper and how that number represents a slope.   + You Do: Students will practice finding the slope individually of 6 graphs and I will rotate around to check answers and offer support. I will have struggling students draw triangles to help calculate the slope. I will also give those students transparency to draw on, so they can see the translation. | | | Resources:  Vocabulary:   * Slope - Numerical measure of a line's inclination relative to the horizontal. * Unit Rate - a rate for one of something. * Horizontal line - a straight line that goes from left to right or right to left. * Positive slope - a line that the changes in x and y will always have the same signs, and it will move upward from left to right. * Negative Slope - a line that is trending downwards as it moves from left to right. * Undefined Slope - The slope of a line is undefined if the line is vertical. * Vertical Line - a line that is perpendicular to the surface or another line that is considered as the base. * Coordinate plane - a two-dimensional plane formed by the intersection of two number lines. * Coordinate - A pair of numbers that describe the position of a point on a coordinate plane by using the horizontal and vertical distances from the two reference axes. * Ordered Pair - a composition of the x coordinate (abscissa) and the y coordinate (ordinate), having two values written in a fixed order within parentheses. * Equation - statement of equality between two expressions consisting of variables and/or numbers. * Algebraic Expression – a symbol or a combination of symbols used in algebra, containing one or more numbers, variables, and arithmetic operations * Numerator - the part of a fraction that is above the line and signifies the number to be divided by the denominator. * Denominator - the part of a fraction that is below the line and that functions as the divisor of the numerator. * Ratio - shows the relative sizes of two or more values. * Translation - moving a shape without rotating or flipping it * Students should understand that unit rate can be graphed. Students should also understand that a translation is a “slide” and that the image will keep all angles and measurements the same. Students will also understand that the equation y = (any number) will be graphed as a horizontal line.     Symbolism/Notation:  +, -, x, ÷    Monitoring/Scaffolding:   * Monitor students’ discussions and individual progress. * Scaffold the similar triangles method by using a transparency. * Differentiation of a problem set for students who finish early and “key problems” for those who need additional help. |
| Level of Cognitive Complexity: | ☐ Creating  ☐ Evaluating  ☐ Analyzing | ☐ Applying  ☐ Understanding  ☐ Remembering | |
| Key questions: | * Which graph looks steeper? * How could I explain how to get from one point to the other? * How can I write that as a ratio? * What does each ratio mean? * What equation represents a horizontal line? * What happens when I translate a point? * What did you notice when you compared the graphs? * Does the same relationship exist with negative slopes? * What is the slope of the proportional relationship? * What is the unit rate of mowing the lawn? | | |
| Closure: | * Before moving to the exit ticket, I will ask the students to summarize the key points of the lesson. | | |
| Next Steps: | Students will use what they know about the ratio of the steepness of the line to create the formula for finding slope between two points without using a graph. | | | **Formative Assessment Criteria for Success:**   * Bellringer- I will use the bellringer to review unit rate. * Discussion Post- I will give the students time to find something that would represent slope to them. Students will post individually and then we will discuss. * Direct Instruction (Opening Exercise)- We will work as a class on the opening exercise and I will model questions students should ask with their partner. I will also show the video so students can visually see a positive, negative, zero, and undefined slope. * Partner Work- I can rotate and listen to discussions, checking to make sure they understand the way to represent slope. * Individual Work- As students work, I can rotate and check understanding of slope. * Unit Rate Example- I will use a class discussion to see how much students can relate the slope to unit rate. * Exit Ticket- I will use the exit ticket to see if students can determine the slope of a line.   + Exit Ticket will show two graphs, one having a positive slope and the other having a negative slope. Students will need to correctly identify the slope of the line. |