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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, ÷$$y=mx+b $$ 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.
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| 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?
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| Closure:  | * Before moving to the exit ticket, I will ask the students to summarize the key points of the lesson.
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| 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.
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