Curriculum Sample: 8th Math
Max. 8 Pages

Grade Level	8	**Content Area**	Math
Course Title (grades 9-12 Only)			
Length of Unit	Five 55-minute periods	**Time of Year**	Second Quarter
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students will have a basic working knowledge of order of operations and proportions. They will understand the concept of fractions and decimals. Students will also know the definition of similar triangles and how to plot points on a coordinate plane.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	The school's program of instruction stresses alignment with research-supported instructional techniques of Hunter's Essential Elements of Instruction. Instruction during this unit will include direct instruction of key points and examples, guided practice including worksheets and partner activities, independent practice, and daily formative assessments conducted at the end of each class period.		
Standard Number and Description *List the Number* and full description for the required Standard.*	8.EE.6 **Grade:** 8 **Domain:** Expressions and Equations (EE) **Cluster:** Understand the connections between proportional relationship, lines, and linear equations. **Standard:** #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.		
Summative Assessment *Describe a cumulative and comprehensive activity, clearly separate from instruction and guided or independent practice, which allows each student to individually demonstrate mastery of the required Standard. A copy of the summative assessment must be attached to the curriculum sample.*	Students will complete a 10 question open-response summative to assess their ability at determining slope from a graph and writing an equation of a line using $y = mx + b$ format. The summative is attached.		
Scoring Scale and Mastery Level *Explain how the assessment is scored, to include points per question, how points are awarded, total points possible, criteria necessary to*	The 10 open-response questions will be scored on an absolute scale with an answer key provided for both correct answers and appropriate justification. Credit will only be awarded for answers that completely match the answer key, and no partial credit will be awarded. Students must get at least 8 of the 10 questions completely correct to master the standard.		

demonstrate mastery, and grading scale. A copy of the answer key and scoring rubric (whichever applicable) must be attached to the curriculum sample.	
Materials/Resources Needed	Worksheets, note cards, construction paper

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed	**Instruction**	**Student Activities**
1	SWBAT define slope and understand the differences between positive, negative, zero, and undefined slopes Key Points: • Slope, m, is defined as rise over run, or the change in y over the change in x and is written as a fraction • Slope is a constant value at any point along the line • A positive slope means that the line goes up from left to right • A negative slope means that the line goes down from left to right • For a vertical line, slope is undefined For a horizontal line, slope is 0	Do Now: Students will review basic concepts of a coordinate plane and reducing fractions Guided Practice: Students will be given an envelope with various graphs and values for slope. They will then work with a partner to categorize the slopes as positive, negative, zero, or undefined. Independent Practice: Students will create a brochure that explains the different types of slope and provides examples of each. Exit Ticket: Students must answer the following question and explain their thinking: *What is slope and why is it important when you are looking at a line?* *Extension: Can you think of a real world application of slope?*
2	SWBAT determine slope, m, from two points on a coordinate plane using similar triangles Key Points: • Slope, m, is defined as rise over run, or the change in y over the change in x and is written as a fraction • Between two coordinate points, (x_1,y_1) and (x_2,y_2), the equation to find the slope is $m=\frac{y_2-y_1}{x_2-x_1}$ • If the slope is an integer, it can be written as a fraction by putting the integer over 1 • Similar triangles can be used to prove that the slope is the same at any two points on the line Because the triangles on a line are similar, the size doesn't affect the slope – it is always the same value (when the fraction is reduced)	Do Now: Students will begin with a warm up activity that reviews similar triangles, reducing fractions, and plotting points on a coordinate plane. Guided Practice: Students will participate in a Think-Pair-Share where they work through an example problem, pair up with another student, and share their answers. Independent Practice: Students will create 10 unique problems by placing two points on a coordinate plane and drawing a line. They will then stand up and trade their problems with 10 other students in the class and check each other's answers. Exit Ticket: Students must answer the following questions and explain their thinking: *Why is slope always the same even if the similar triangles are different sizes?* *Why do we have to reduce our fractions when finding slope?*
3	SWBAT derive the equation of a line when given the slope, *m*, and y-intercept, *b*, in the format *y = mx + b*	Do Now: Students will review key concepts about how to find slope from yesterday's lesson and answer 5 review questions.

	Key Points: • The slope-intercept form of a line is expressed as *y = mx + b* where *m* is the slope and *b* is the y-intercept • The y-intercept is the point where the line crosses the y-axis • The x and y values refer to points on the line and are written as a coordinate point (x, y) To write an equation for a line given the values of *m* and *b*, plug the values into the slope-intercept form	Guided Practice: Students will be given note cards with different values for the slope and y-intercept. Students will work in partners to create 10 unique equations (given the information on the note cards) and classify whether the slopes are positive, negative, or zero. Independent Practice: Students will complete a worksheet that includes problems and open-ended response questions to gauge the students' understanding of slope concepts Exit Ticket: Students must answer the following questions and explain their thinking: *What is slope? What is the y-intercept? What do these look like on a graph?* *Extension: How do you think you would write an equation for a line if you weren't given the value of the slope?*
4	SWBAT derive the equation of a line in the form *y = mx + b* from a given graph, both with and without a value for *b* Key Points: • To write an equation from a graph, first identify the y-intercept, *b* • Second, find the slope of the line through two points and reduce the fraction • Third, plug in the values for *m* and *b* into the equation *y = mx + b* • To verify that you have the correct equation, pick a coordinate point and plug in the values of x and y. If the equation is correct, the values will be equal If a line passes through the origin, the *b* value is 0 and the equation will be in the form *y = mx*	Do Now: Students will review key concepts from the previous lessons by answering 5 review questions. Guided Practice: Students will be given a worksheet with multiple graphs along with blank note cards. The teacher will instruct the students to find the values for *m* and *b* and write them on the note cards. Students will then arrange the cards into an equation and write it on their worksheet. Independent Practice: Students will create a quiz where they draw 10 individual graphs. They will then find the equations for 5 of the graphs and leave the remaining 5 questions unfinished for tomorrow's lesson. Exit Ticket: Students must answer the following question and explain their thinking: *Explain the process of finding the equation for a line from a graph. Include each individual step.*
5	SWBAT to derive the equation of a line in the form *y = mx + b* from any given information including from a graph or from two points Key Points:	Do Now: Students will complete a brief review worksheet that summarizes everything learned thus far. Guided Practice: Students will share their quizzes from yesterday with

	• This is a continuation of yesterday's lesson and combines everything the students have learned from the previous four lessons The focus is on challenging students to derive equations for lines using multiple methods and being able to justify their answers	another student and complete the remaining 5 questions, helping each other if needed. Independent Practice: Student assessment. Exit Ticket: Summative assessment.

Paste Summative Assessment Here:

1. What is the equation for the **slope-intercept form** of a line? _____

2. What is m? a) x-intercept b) y-intercept c) slope d) y-axis

3. What is b? a) x-intercept b) y-intercept c) slope d) y-axis

Identify the slope, m, and y-intercept, b, of each equation.

4. $y = -2x + 1$

Slope (m): _____

y-intercept (b): _____

5. $y = \frac{1}{3}x - 4$

Slope (m): _____

y-intercept (b): _____

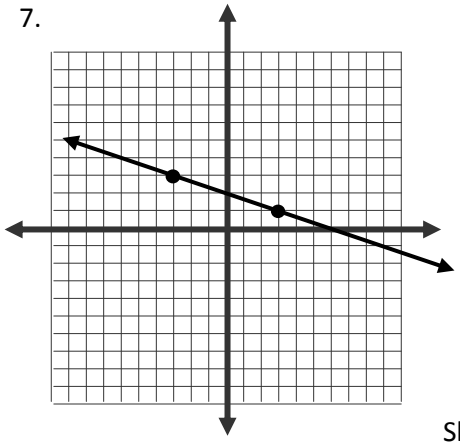
6. $y = -\frac{4}{3}x$

Slope (m): _____

y-intercept (b): _____

Find the slope of the following lines. Tell if the slope is POSITIVE, NEGATIVE, ZERO, or UNDEFINED

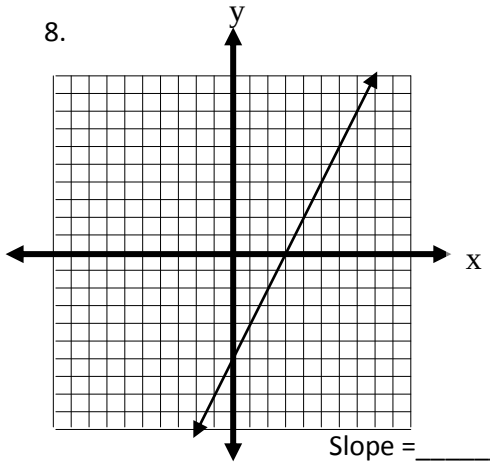
7.



Slope = _____

Circle: POSITIVE NEGATIVE ZERO UNDEFINED

8.

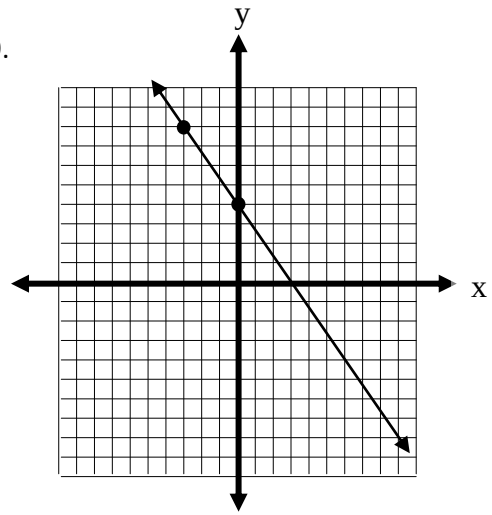


Slope =_____

Circle: POSITIVE NEGATIVE ZERO UNDEFINED

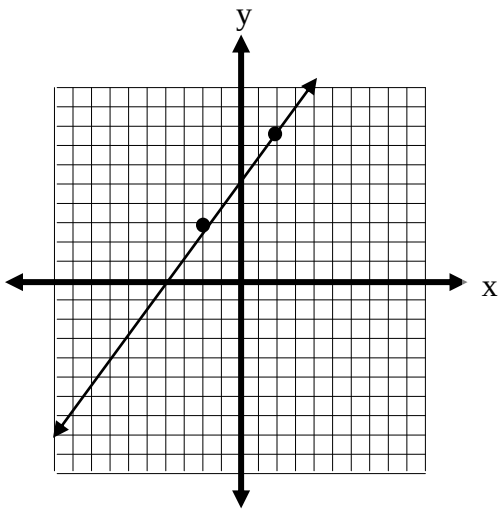
Find the equation of the following lines in slope-intercept form.

9.



Equation: _____

10.



Equation: _____

Paste Answer Key/Scoring Rubric Here:

Student must answer all parts of the question correct in order to receive full credit. Each question is worth 1 point. Student must answer 8 out of 10 correctly in order to master the standard.

1. y = mx + b
2. c) slope
3. b) y-intercept
4. m = -2 b = 1
5. m = $\frac{1}{3}$ b = -4
6. m = $-\frac{4}{3}$ b = 0

7. m = $-\frac{1}{3}$; negative
8. m = 2; positive
9. $y = -\frac{4}{3}x + 4$
10. $y = \frac{5}{4}x + 5$