Title: Introducing Slope

Objectives	**Time frame to Complete**
Students will understand slope and use equations and graphs to determine slope.	30-45 minutes
	NRS EFL
	4

Stackable Cert. Documentation	*Technology*	*Study / Life skills*	*EL-Civics*	*Career Pathways*	Police	Paramedic	Fire Rescue	Medical Asst.	EKG / Cardio	Phlebotomy	Practical Nursing	Healthcare Admin	Pharmacy Tech	IMT	AMT	HVAC	Welding	Other:					
X																							

Standard(s) Addressed in Lesson

Use Math to Solve Problems and Communicate

Benchmark(s) Addressed in Lesson

M.4.8 Connect graphical and algebraic representations of lines.
M.4.10 Represent and analyze figures using coordinate geometry.
M.4.18 Graph linear equations.
M.4.19 Solve linear equations with one unknown graphically and algebraically.
M.4.20 Collect, organize and interpret data sets involving a single variable.

Materials

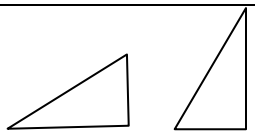
- *Finding Slope* worksheet
- computer, access to website: http://www.mathsisfun.com/data/straight_line_graph.html
- (optional) graph paper, available online at http://illuminations.nctm.org/lessons/GridPaper-Small.pdf

Learner Prior Knowledge

Students should be familiar with graphing ordered pairs on a coordinate plane.
Students should be able to solve equations with at least one variable.

Activities

Step 1 Draw a picture of two triangles on the board.



Discuss which "mountain" is steeper and how students know which is steeper. (They may indicate that the second triangle is taller and narrower.) Introduce slope as a measure of rise (height) over run (length) and can be determined using a mathematical formula.

Step 2 Add information to the pictures of the mountains. The first mountain is 4 kilometers wide and 2 kilometers tall. Demonstrate that you can find the slop by analyzing the rise (height) over the run (length). 2/4 = ½. The slope of the first hill is ½. This means that for every kilometer you walk up the mountain you have walked two kilometers across the mountain. Students should determine the slope of the second mountain. The second mountain is 2 kilometers wide and 4 kilometers tall. (Slope = 2/1 = 2)

Step 3 It is possible to find the slope of any straight line. Distribute the *Finding Slope* handout. Show students

how to count the rise and run based upon the graphs in section one.

Step 4 Explain that the equation of a line is y=mx+b. M represents the slope, and b is the Y-intercept (where the line crosses the y-axis). Students graph lines based upon ordered pairs in section two and find the equation of the lines. If students have difficulty with the worksheet in this section, they may practice graphing lines on the website http://www.mathsisfun.com/data/straight_line_graph.html

Step 5 In section three of the worksheet, students will be solve equations and graph the lines. In section four, students will write equations based upon graphs.

Step 6 Check work for accuracy. Save the assignment in the portfolio as documentation for a Basic Skills Stackable Certificate.

Assessment/Evidence

Finding Slope worksheet – Collect this for the student portfolio if it is being used to document related skills for the Basic Skills Stackable Certificate.

Adaptations for Beginning Students

Beginning students may need additional practice understanding coordinates (ordered pairs). They could review coordinates by playing the Graph Mole game online: http://funbasedlearning.com/algebra/graphing/points/ In this game, students are farmers who have to use coordinates to identify where a mole is in their garden before the moles eats their vegetable crops. There are three levels of difficulty (and speed).

Adaptations for Advanced Students

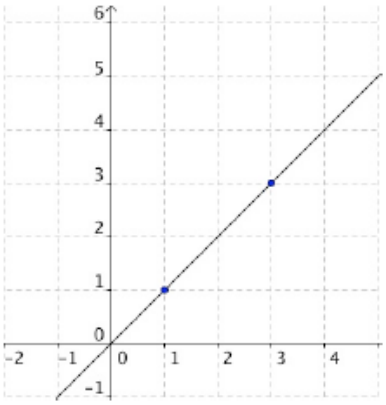
Teacher Reflection/Lesson Evaluation

This lesson was created by Middletown ABLE.

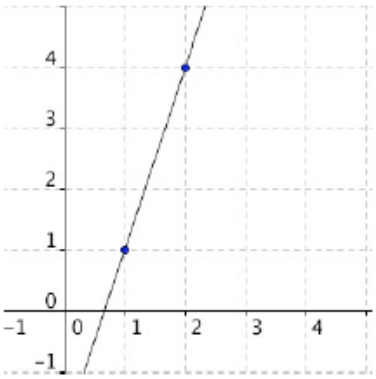
Finding Slope

Section One: Find the slope based upon the graphs.

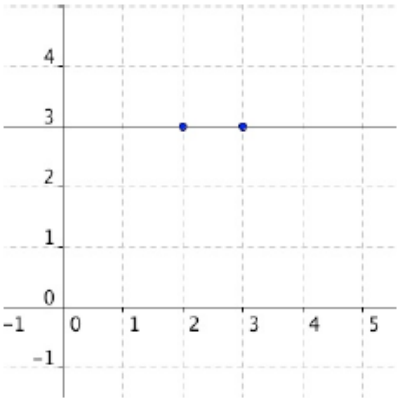
1. Slope = _____



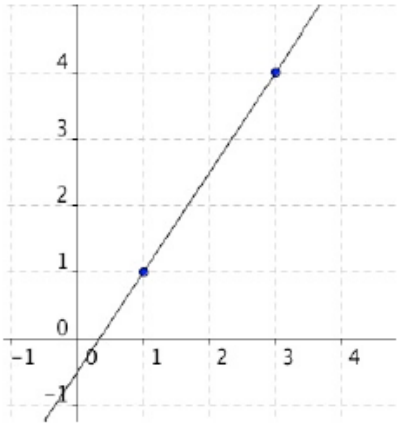
2. Slope = _____



3. Slope =_____

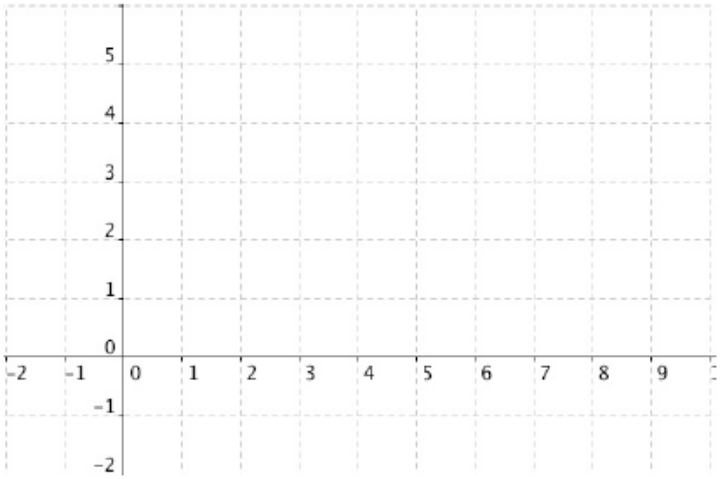


4. Slope =_____



Section Two: Graph the following points, draw a best fit line, and determine the slope.

5. (-1,0) (2,1) (5,2) (8,3)



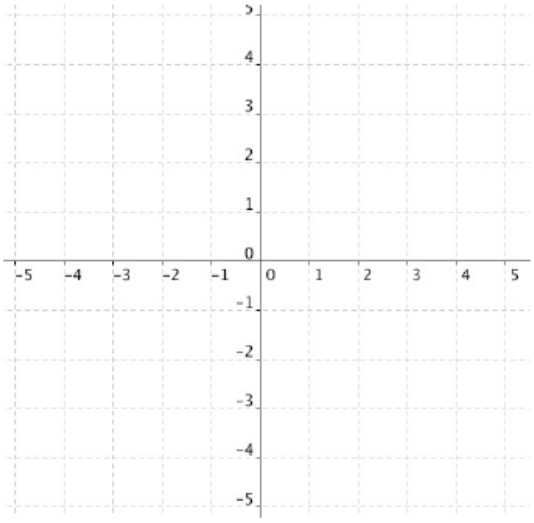
Slope = _____

Finding Slope

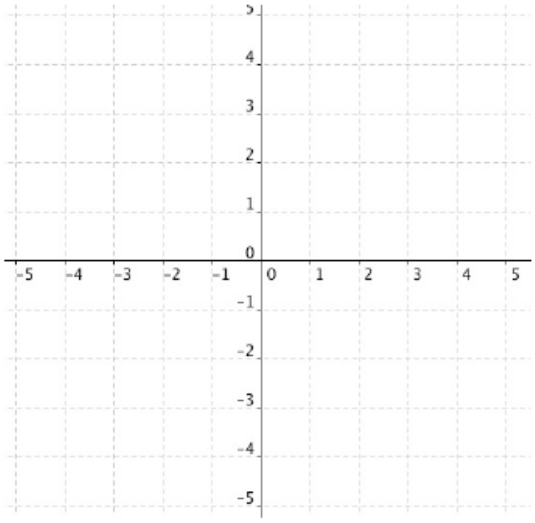
The formula for a straight line is **y = mx + b**.
M represents the slope of the line; B represents the y-intercept (point where the line crosses the y-axis.

Section Three: Solve each equation and graph the lines represented.

6. y = 4x - 3

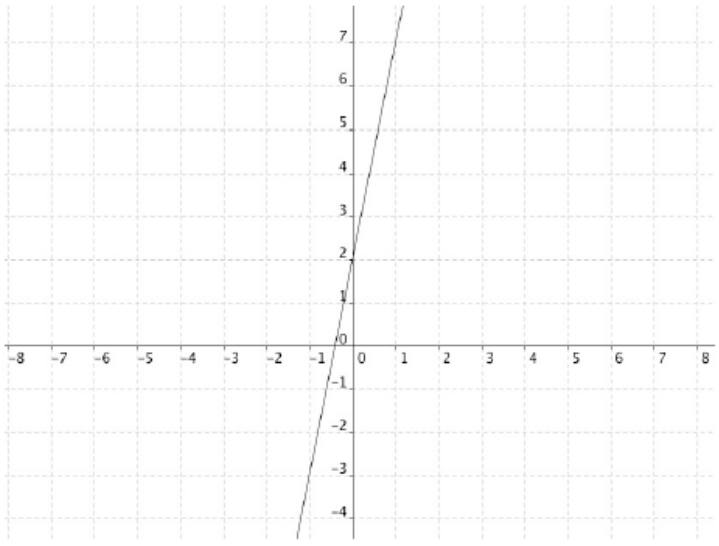


7. y = -2x + 1



Think carefully about the negative slope (-2). In which direction will you "run"?

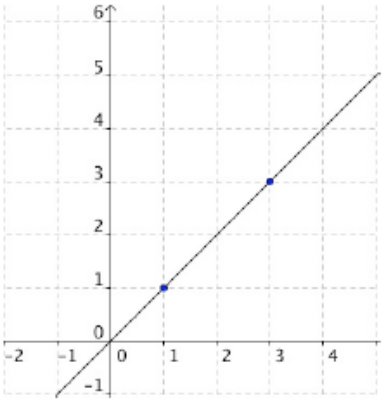
Section Four:
8. Write an equation for the following line:



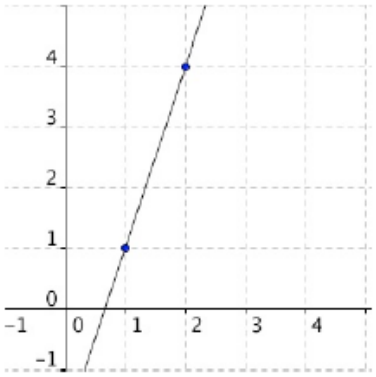
Finding Slope

Section One: Find the slope based upon the graphs.

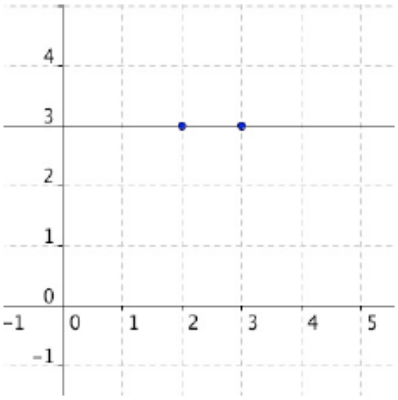
1. Slope = ___1__



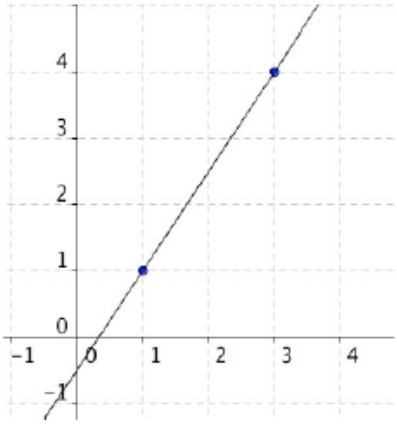
2. Slope = __3___



3. Slope =___0__

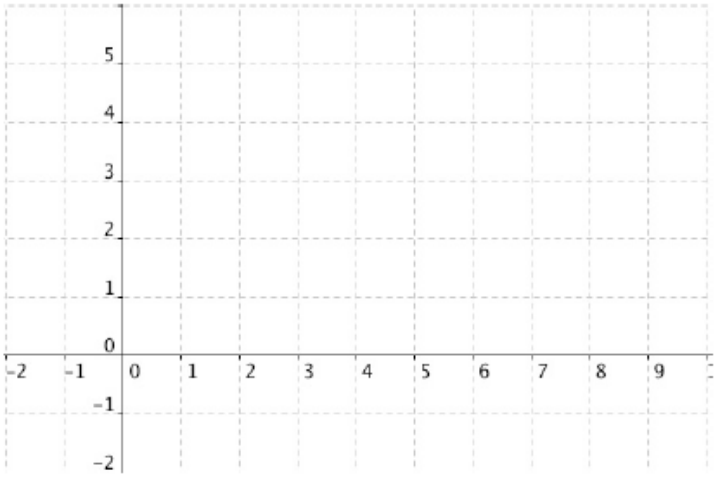


4. Slope =__3/2___



Section Two: Graph the following points, draw a best fit line, and determine the slope.

5. (-1,0) (2,1) (5,2) (8,3)



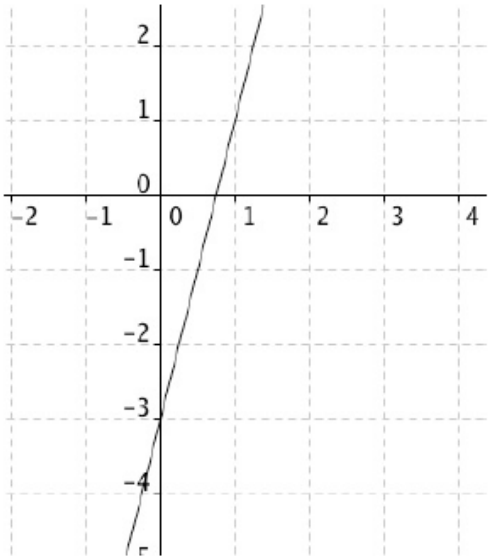
Slope = __1/3___

Finding Slope

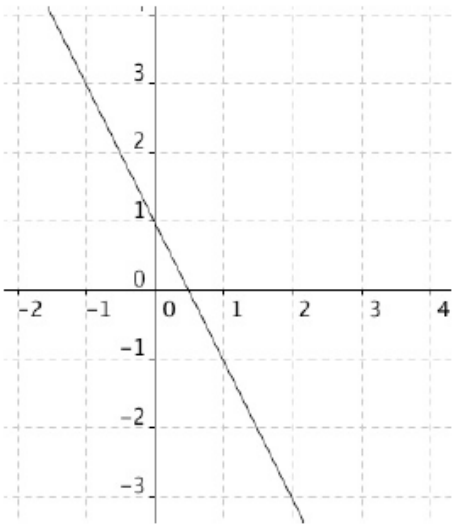
The formula for a straight line is **y = mx + b**.
M represents the slope of the line; B represents the y-intercept (point where the line crosses the y-axis.

Section Three: Solve each equation and graph the lines represented.

6. y = 4x - 3



7. y = -2x + 1



Think carefully about the negative slope (-2). In which direction will you "run"?

Section Four:

8. Write an equation for the following line:

Y = 5x+2