

Graphing Linear Equations - An investigation of slope

WebQuest Description: Slope is more than the result of plugging in x and y coordinates into a formula to find a rational number. The idea of describing how a line changes from point to point carries over into calculus. In this webquest you will answer the following questions:

What does slope mean when a graph represents real-world data?

What does slope mean in connection to direct variation?

Once an equation is written, how can you identify slope?

Grade Level: 9-12

Curriculum: Math

Keywords: Graphing Linear Equations, Slope

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Introduction

Have you ever really wondered what "slope" is? Do you ever go snow skiing on the slopes that have a steep drop? Have you ever built a skateboard ramp before? How steep do you really need to make those steps? All of these are questions that you can analyze after discovering all about SLOPE! Rate of change is a ratio that describes how one quantity changes with respect to another. Slope can be used to describe rate of change. The slope of a line is the ratio of the vertical change in the line to the horizontal change in the line. The slope can be expressed in several ways.

Tasks

During this webquest you will be: 1. Learning what slope is. 2. Finding the slope of a line from a graph. 3. Identifying positive, negative, zero, and undefined slope. 4. Investigating real-life examples of slope.

Process

Day 1 - Part 1 Open a Word Document and Save it as Webquest Vocabulary. In this document, write the following vocabulary terms, leaving space between each word that will be defined as you complete the webquest. Words: Rate of Change; Slope; Positive Slope; Negative Slope; Zero Slope; Undefined Slope; Coordinates; Day 1 - Part 2 Go to the website <http://www.dictionary.com> or a similar website. Look up the vocabulary terms Rate of Change and Slope. Record these definitions in your Webquest Vocabulary document. Day 1 - Part 3 Go to the following website http://www.teachertube.com/view_video.php?viewkey=13d62132dda54ef1ec86. Watch the video covering Rate of Change / Slope. Next, go to the stairwell. Take with you a ruler and a sheet of paper. On your paper, I want you to determine the slope of the steps, expressed as a rate of change (rise/run). Measure the rise and run of the steps in inches. Record the rise and run on your paper. Then, using these measurements determine the slope of the steps. Day 1 - Part 4 Download and print the word Document entitled - Rate of Change Worksheet - Webquest. Review the example problem and then solve Real-world problem 1 and 2. Day 1 - Part 5 Download and print the word Document entitled - Graphs of linear Equations Worksheet - Webquest. Review the example problem and then solve the listed problems. Day 1 - Culminating Event (Formative Assessment) This is your mission. You are to take the role of instructor and explain to me in a few paragraphs how I would do the items below in Part I. Keep in mind that I will be following only your instructions and that I am a beginning Algebra student. This assignment needs to be completed and typed using Microsoft Word. How do I determine the rate of change after being given a set of data? How do I determine the slope of a line by looking at a graph of a linear equation? Day 2 - Part 1 Search the internet for examples of positive, negative, zero, and undefined slope. Copy 1 example down for each type of slope and label it properly (whether it is positive slope, negative slope, etc.) Download Identifying + - zero-undefined slope worksheet. Identify what type of slope each picture has.

Evaluation

Category and Score	Beginning 1	Developing 2	Very Good 3	Exemplary 4	Score
<p>Student will create a Microsoft Word document and save it properly.</p> <p>Student will include proper terms and define them properly.</p>	<p>Student saves document properly, but doesn't include the proper terms or definitions</p>	<p>Student saves document properly, includes the proper terms but doesn't include all of the definitions.</p>	<p>Student saves document properly, includes proper terms, but doesn't include the proper definitions.</p>	<p>Student saves document properly, includes proper terms and definitions.</p>	20
<p>Student will be able to measure the rise and run of the stairs measuring in inches.</p> <p>Student will be able to correctly determine the slope of the stairs.</p>	<p>Student doesn't correctly measure the rise and run.</p> <p>Student doesn't use the proper units of measurement.</p> <p>Student does not correctly determine the slope of the steps.</p>	<p>Student correctly measures the rise and run of the steps, but does not include the proper units.</p> <p>Student does not correctly determine the slope of the steps.</p>	<p>Student correctly measures the rise and run of the steps in inches.</p> <p>Student does not correctly determine the slope of the steps.</p>	<p>Student correctly measures the rise and run of the steps in inches.</p> <p>Student correctly determines the slope of the steps.</p>	20
<p>Student will be able to determine the rate of change given a set of data.</p> <p>Students will be able to determine the slope of a line by looking at the graph.</p>	<p>Student shows no understanding of rate of change or slope.</p>	<p>Student doesn't correctly determine the rate of change or slope, but makes only minor mistakes.</p>	<p>Student correctly determines one or the other (rate of change or slope).</p>	<p>Student correctly determines the rate of change from a given set of data.</p> <p>Student correctly determines the slope of a line from a graph.</p>	20
<p>Student will be able to teach me how to determine the rate of change given a set of data.</p> <p>Student will be able to teach me how to determine the slope of a line from a graph.</p>	<p>Students doesn't succeed in teaching me how to determine the rate of change and slope. Student uses no proper terminology.</p>	<p>Student correctly teaches me how to either determine the rate of change or slope and uses minimal proper terminology.</p>	<p>Student teaches me how to determine the rate of change and slope, but instructions are unprecise and correct terminology is used minimally.</p>	<p>Student clearly and precisely teaches me how to determine the rate of change from a set of data and the slope from a graph.</p> <p>Student uses proper terminology when talking about slope/ rate of change.</p>	40
				Total Score	%100

Conclusion

In this lesson you will have learned how to determine a rate of change of real-life situations. You will also have learned how to determine the slope of a line by analyzing a graph. After completing the culminating activity you have now increased your knowledge depth of the topics by becoming the instructor and teaching me how to do these things as well.I hope you had fun during part 1 of your webquest!

Teacher Page

Standards

Credits

Other