

Understanding Slope¹

Grade Level: 9-12

Time Frame: 1 hour

Overview	The purpose of this lesson is to teach students how to evaluate slope using the slope formula and understand the relationships between the slopes of lines that are flipped horizontally and vertically.
Objectives	<p>Following this lesson, students will have:</p> <ul style="list-style-type: none"> ▪ Found pictures containing straight lines which they can find the slopes for ▪ Flipped and printed both the original and flipped images using Picjuice, a simple online photo editor ▪ Evaluated slope using the slope formula ▪ Justified their answers showing positive, negative, zero, and undefined slopes calculated
Materials	<ul style="list-style-type: none"> ▪ Computers (one for each student) with Internet connection ▪ Printer ▪ Graph Paper ▪ Pencils ▪ Rulers
Procedure	<ol style="list-style-type: none"> 1. Define slope and write the formula on the board. 2. Ask students to get online and find pictures with solid, straight lines in them to use as real-world examples of slope. 3. Ask students to access Picjuice through www.picjuice.com and upload the pictures to flip and rotate them to form different lines. 4. Tell students to print their images. 5. Using an example image, show how positive slopes correlate to lines pointing upward and right. 6. Using a flipped example, show how negative slopes correlate to lines pointing downward and right. 7. Draw an x and y axis and create a big square, labeling the corners with a, b, c, and d. 8. List the coordinates of each point. 9. Use line segment ab and calculate the slope on the board using the slope formula. This process continues until slope is calculated for each line segment. Show how each is positive, negative, zero, or undefined. 10. Hand out graph paper to each student and ask them to create a picture using a minimum of 10 points.

¹ Adapted from <http://www.lessonplanspage.com/MathArtCalculatingSlopeThroughPictureDesign912.htm>

	11. Announce that their homework is to explain in their own words how to find slope and to find the slope of all line segments using those ten points, as done in class on the board.
Evaluation	Homework