EDSTAR ANALYTICS | Deep Dive 5
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Slope: The Rate of Change Gets Its Name

Slope is rise over run: the change in y on top, the change in x on the bottom. Find it from a graph, a table, and two points, and read the sign and the size.

Name _____ Date _____

Words we use

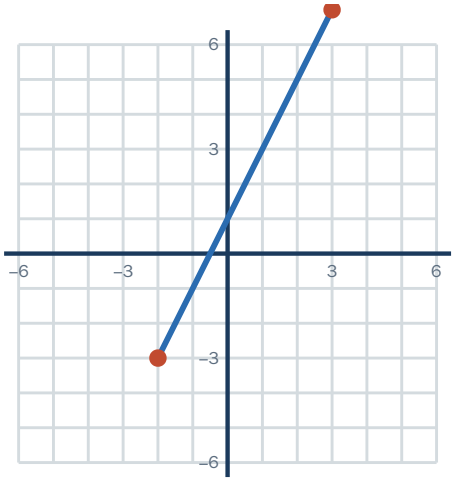
say the math word, then the plain English

WORD	PLAIN ENGLISH	WHAT YOU DO
Slope	The rate of change: how much y changes for each step of x. Rise over run.	Pick two points, count or subtract, divide, simplify.
Rise	The change in the output: how much y went up or down. The top of the fraction.	Second y minus first y. Down is negative.
Run	The change in the input: how far you moved to the right. The bottom of the fraction.	Second x minus first x, same order.
Positive slope	Climbing, left to right.	The rise was up.
Negative slope	Falling, left to right.	The rise was down.
Zero slope	Flat: a horizontal line. y never changes.	Rise 0.

Part A Count it on the grid

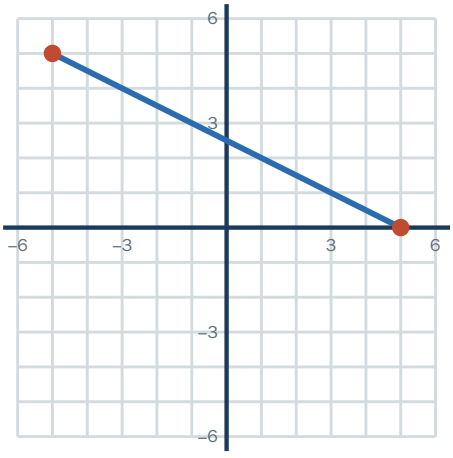
Each grid shows a line through two marked points. Draw the staircase, count the rise and the run, and write the slope as a simplified fraction.

1. Through (0, 1) and (2, 5)



rise ____ run ____ slope ____

2. Through (−3, 4) and (3, 1)



rise ____ run ____ slope ____

Part B From a table

Write the step in x, the change in y, and the slope.

TABLE	STEP IN X	CHANGE IN Y	SLOPE
x: 0, 1, 2, 3 y: 4, 7, 10, 13			

x: 0, 2, 4, 6 y: 9, 6, 3, 0

7. y: 2, 4, 6

Part C From two points

Rise: second y minus first y. Run: second x minus first x. Divide and simplify.

1. (2, 3) and (5, 12)

2. (0, 8) and (4, 0)

3. (–2, –1) and (4, 2)

4. (3, 5) and (7, 5)

5. (6, 1) and (6, 9)

Part D Read the number

For each slope write climbs, falls, flat, or vertical, then rank them from steepest to gentlest (ignore vertical).

SLOPE	CLIMBS, FALLS, FLAT, VERTICAL
5	
–1/4	
0	
–3	
undefined	

Steepest to gentlest: _____

Part E In your own words

1. What is slope? Say it with rise and run, and say it with rate of change.

2. Why must you subtract in the same order on the top and the bottom?

3. Why does a vertical line have no slope, while a horizontal line has slope 0?

Part F Exit ticket

1. Slope through (2, 1) and (6, 9):

2. x = 0, 3, 6 and y = 12, 6, 0: slope?

Answer key

Part A. 1. Rise 4, run 2, slope 2. 2. Rise –3, run 6, slope –1/2.

Part B. Step 1, change 3, slope 3. Step 2, change –3, slope –3/2. Step 3, change 2, slope 2/3.

Part C. 1. 9/3 = 3. 2. –8/4 = –2. 3. 3/6 = 1/2. 4. 0/4 = 0, flat. 5. 8/0, undefined, vertical.

Part D. 5 climbs, –1/4 falls, 0 flat, –3 falls, undefined vertical. Steepest to gentlest: 5, –3, –1/4, 0.

Part E. 1. Rise over run; how much y changes for each step of x. 2. Otherwise the sign comes out wrong. 3. Vertical: run 0, cannot divide by 0. Horizontal: rise 0, so 0.

Part F. 1. 8/4 = 2. 2. –6/3 = –2.