

LINEAR FUNCTIONS



a 14 day TEKS-aligned unit

TEKS: A.2B, A.2C, A.2H, A.3A, A.3B, A.3C, A.3D

ready-to-go, scaffolded
student materials

LINEAR FUNCTIONS UNIT

Table of Contents

PAGE	TOPIC	RESOURCE
4	Sample Pacing Guide	
5-6	Ideas for Implementation and Helpful Hints	
7-15	Binder Covers, Dividers and Spine Labels	
17-18	Slope and Rate of Change	Student Handout 1
19-20	Slope and Rate of Change	Homework 1
21-22	The Slope Formula	Student Handout 2
23-24	The Slope Formula	Homework 2
25-26	Slope-Intercept Form	Student Handout 3
27-28	Slope-Intercept Form	Homework 3
29-30	Applying Slope-Intercept Form	Student Handout 4
31-32	Applying Slope-Intercept Form	Homework 4
33-34	Quiz: Slope and Slope-Intercept Form	Quiz 1
35-36	Point-Slope Form	Student Handout 5
37-38	Point-Slope Form	Homework 5
39-40	Applying Point-Slope Form	Student Handout 6
41-42	Applying Point-Slope Form	Homework 6
43-44	Standard Form	Student Handout 7
45-46	Standard Form	Homework 7
47-48	Graphing Linear Equations	Student Handout 8
49-50	Graphing Linear Equations	Homework 8
51-52	Quiz: Point-Slope and Standard Form	Quiz 2
53-54	Graphing Linear Inequalities	Student Handout 9
55	Graphing Linear Inequalities	Homework 9
57-58	Writing Linear Inequalities	Student Handout 10
59	Writing Linear Inequalities	Homework 10
61-64	Linear Functions Study Guide	Review
65-68	Linear Functions Unit Test	Test

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student friendly + real-world application

scaffolded concepts

Unit: Linear Functions
Student Handout 4

Name _____
Date _____ Pd _____

APPLYING SLOPE-INTERCEPT FORM

List everything you know about the linear equations and their graphs by looking only at each equation in the table below.

a. $y = -17x - 2$	b. $y = \frac{3}{4}x$	c. $y = 0.5x + 8$	d. $y = 9$

Given the equation $6y = 3x - 18$, Natalie has a graph of the line. The line has a slope of 3 and the y-intercept is -18. Explain Natalie's work in the box at the right to find the correct y-intercept.

Find the slope and the y-intercept for each equation.

1. $-2y = 9x + 24$	2. $y = \frac{1}{2}x - 3$
slope: _____ y-int: _____	slope: _____ y-int: _____

4. Write an equation of the graphed line below. Next, circle the name(s) of any student below that also matches the graphed line.

CARLOS	SARA DETH
$-3y = -12x - 18$	$y = -2 + 2(2x - 3)$

Unit: Linear Functions
Homework 4

Name _____
Date _____ Pd _____

APPLYING SLOPE-INTERCEPT FORM

Apply your knowledge of slope-intercept form to answer questions 5-10.

5. The function $f(x) = 7.5 + 2.5(x - 1)$ can be used to represent the total cost of swimming at a community pool for x hours. What is the rate of change of the cost in dollars with respect to the number of hours? Explain.

6. Create a graph of each equation below.

a. $-6y = 2x - 6$ b. $y = 0.5(4x - 6)$

7. Record the letter of each graph next to the relationship.

GRAPH A

GRAPH B

self-checking practice

Unit: Linear Functions
Homework 4

Name _____
Date _____ Pd _____

APPLYING SLOPE-INTERCEPT FORM

In 1-4, draw a line connecting each linear equation to its slope and then to its y-intercept.

EQUATION	SLOPE	Y-INTERCEPT
1. $y = 6 + \frac{2}{3}x$	$\frac{3}{2}$	-8
2. $-3y = 2x + 9$	6	-3
3. $y = \frac{2}{3}(12x - 9)$	$\frac{2}{3}$	6
4. $y - 2 = 2(3x - 5)$	$-\frac{2}{3}$	$\frac{2}{3}$
	8	-6

In 5-8, record the name of the student whose equation could represent the graphed line.

CARLOS

$y = -4 + 2x$

DAMIEN

$-8y = 2x - 32$

KATRINA

$y - 7 = \frac{1}{2}(x - 10)$

TICPPA

$y = -2(2x + 1)$

5. _____

6. _____

7. _____

8. _____

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TEKS: A.2B, A.2C, A.2H, A.3A, A.3B, A.3C, A.3D

streamline your planning
process with unit overviews

LINEAR FUNCTIONS OVERVIEW



STANDARDS

READINESS	SUPPORTING
<p>A.2C write linear equations in two variables given a table of values, a graph, and a verbal description</p> <p>A.3B calculate the rate of change of a linear function represented tabularly, graphically, or algebraically in context of mathematical and real-world problems</p> <p>A.3C graph linear functions on the coordinate plane and identify key features, including x-intercept, y-intercept, zeros, and slope, in mathematical and real-world problems</p> <p>A.3D graph the solution set of linear inequalities in two variables on the coordinate plane</p>	<p>A.2B write linear equations in two variables in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$, given one point and the slope and given two points</p> <p>A.2H write linear inequalities in two variables given a table of values, a graph, and a verbal description</p> <p>A.3A determine the slope of a line given a table of values, a graph, two points on the line, and an equation written in various forms, including $y = mx + b$, $Ax + By = C$, and $y - y_1 = m(x - x_1)$</p>

DIG IDEAS

- Linear functions can be represented in various ways.
- Linear functions have rates of change.
- Linear inequalities have solutions.
- Key features of graphs of functions include the x-intercept, y-intercept, and slope.

ESSENTIAL QUESTIONS

- What information can you determine from a graph of a linear function?
- How is graphing a linear function useful?
- How is writing an equation of a line useful?
- What advantages are there to using different representations of a linear function?

LINEAR FUNCTIONS PACING GUIDE



DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Slope and Rate of Change	The Slope Formula	Slope-Intercept Form	Applying Slope-Intercept Form	Quiz: Slope and Slope-Intercept Form
Student Handout 1 Homework 1	Student Handout 2 Homework 2	Student Handout 3 Homework 3	Student Handout 4 Homework 4	
DAY 6	DAY 7			
Point-Slope Form	Applying Point-Slope Form			
Student Handout 5 Homework 5	Student Handout 6 Homework 6			
DAY 11	DAY 12			
Graphing Linear Inequalities	Writing Linear Inequalities			
Student Handout 9 Homework 9	Student Handout 10 Homework 10			

LINEAR FUNCTIONS OVERVIEW



TOPIC	TEACHING TIPS
Slope and Rate of Change	<ul style="list-style-type: none"> Have students label the x and y coordinates in ordered pairs to avoid misplacing values in the slope formula. Place an equation in each form (slope-intercept, point-slope and standard form) next to each other and compare/contrast the process of identifying the slope from each form. When students are given a graphed line, have them identify two points on the line and label the coordinates next to it. This habit helps set students up to use the slope formula correctly, prevents rise over run counting errors, and will assist with writing equations in future lessons. Consider including extra integer practice (specifically with subtraction of positive and negative values) to help students with the slope formula as well as point-slope form in future lessons.
Linear Equations	<ul style="list-style-type: none"> Check out the "Marble Slides" activity from Desmos for an interactive and engaging practice with linear equations in slope-intercept form: https://teacher.desmos.com/activitybuilder/custom/566b31734e38e1e21a10aac8#preview/d0490916-ebd5-422a-8001-bf6d0ef63136 Consider allowing a class "debate" when solving problems where students can argue for the most appropriate form of linear equation to use. The more students can see how the forms of equations are related but also have different advantages, the better. When introducing point-slope form, consider an extension by including the "discovery" of point-slope form from the slope formula.
Linear Inequalities	<ul style="list-style-type: none"> Check out the "Point Collector: Lines" activity from Desmos to allow students practice with graphing linear inequalities: https://teacher.desmos.com/activitybuilder/custom/57e5435920c2cd506168126 When substituting an ordered pair to check for correct shading on a graph, tell students to look and see if the origin is a point in the shaded region. This is usually the easiest to plug in and helps to avoid mathematical errors in the check step. Pull from students' prior knowledge of representing inequalities on a number line. For example, a solid line on a linear inequality graph is like a solid/filled in circle for the point on a number line. A dashed graphed line is like an open circle for the point on a number line.

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teaching
ideas

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unit study guide + assessments



quizzes



editable unit test

Unit: Linear Functions
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: SLOPE AND SLOPE-INTERCEPT FORM

Show all work as you answer each question below. Record your solutions in the box at the right.

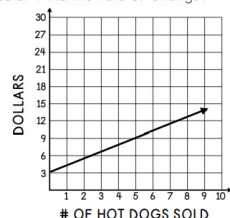
Use the graph at the right to answer 1-4.

Answers

1. _____
2. _____
3. _____

- Find the slope of the line.
- Find the y-intercept of the line.
- Write an equation for the line in slope-intercept form.
- Which of the following equations could graphed line?
a. $5y = -4x + 20$
b. $5y = -4x - 20$

5. Stan sells hot dogs at the local fair. The graph shows the linear relationship between money in his cash register and number of dogs sold. Find the rate of change.



7. Find the slope of the line that passes through the points (0, 2) and (4, 0).
a. $\frac{5}{21}$ b. $\frac{3}{7}$

Unit: Linear Functions
Review

Name _____
Date _____ Pd _____

LINEAR FUNCTIONS STUDY GUIDE

Solve each problem below. Be sure to ask questions if you need more help with a topic.

I CAN FIND SLOPE OF A LINE GIVEN A GRAPH, A TABLE, TWO POINTS AND AN EQUATION. A.3A

- Find the slope of the line that passes through the following sets of ordered pairs:
a. (6, 11) and (9, 26)
b. (14, -5) and (-10, 7)
- The table represents the ordered pairs on a line that

x	y
1	2
2	4
3	6
4	8
5	10

- Record the slope of line A and line B below.
A: _____
B: _____

5. Miguel is going to graph each of the following equations.
a. $y = \frac{2}{5}x - 17$

I CAN CALCULATE THE RATE OF CHANGE

6. The graph shows the altitude of a bird over time. Find the rate of change of the altitude with respect to time.

ALGEBRA 1 CURRICULUM

LINEAR FUNCTIONS

UNIT THREE: ANSWER KEY

answer keys
included



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