learning focus:

✓ identify functions and distinguish between proportional and non-proportional situations

✓ identify values that satisfy two linear equations from a graph

✓ use multiple representations to understand slope, rate of change, and direct variation

LINEAR RELATIONSHIPS UNIT
14 DAY TEKS-ALIGNED UNIT

8th GRADE

A MANEUVERING THE MIDDLE ® RESOURCE

LINEAR RELATIONSHIPS

ready-to-go, scaffolded student materials

LINEAR RELATIONSHIPS UNIT
Table of Contents

LINEAR RELATIONSHIPS

8th GRADE

student friendly + real-world application

interactive practice

Unit: Linear Relationships
Student Handout 1

Name _____
Date _____ Pd _____

IDENTIFYING FUNCTIONS

A donut shop has a small vending machine with the items shown.

a. If Nate inputs B2, what will he receive?
b. If Mia inputs A2, what will she receive?
c. If 5 people in a row input B1, what sho... each receive?

	A	B
1	MILK	CHOC. MILK
2	ORANGE JUICE	APPLE JUICE

FUNCTIONS
- A function is a relati...
  _____. Each _____
- A graph that is a fu...
  _____ line.

- Would a vending machine like the one s...

- A customer chose A3 and received fru... milk, would the vending machine repres...

Determine if each representation shows y...

1.				
x	-2	-1	0	1
y	7	1	-1	1

3.
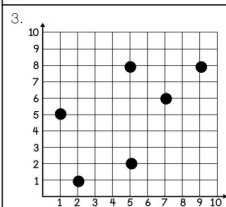
Determine if each representation is a function by writing "yes" or "no." Justify your answers.

5.	6.	7.

5. {(3, 7), (4, 7), (5, 7), (6, 7)}

6.	x	-7	-5	-7	5
	y	1	3	-1	13

7.

8.
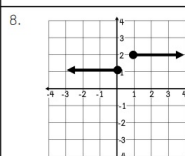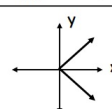
10. The set of ordered pairs shown is

{(9, -1...

a. Give an example of an x-value that
b. Give an example of an x-value that

Create your own examples and non-ex...

EXAMPLES

{(___ , ___) (___ , ___) (___ ,

x		
y		
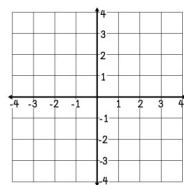
Summarize today's lesson:

Unit: Linear Relationships
Homework 1

Name _____
Date _____ Pd _____

IDENTIFYING FUNCTIONS

Students were asked to create a representation of y as a function of x. Circle the names of the students who correctly completed the task. Then, unscramble the underlined letters of the circled names to answer the question at the bottom.

CHARLOTTE

SOFIA

DESHAUN

{(-6, 7), (-1, 4), (2, 9), (-6, 11)}

JACE

NATHAN

x	-4	0	5	11
y	-8	-13	-4	14

COLBY

ABBY

ORLANDO

{(9,-2), (7, 5), (4,-3), (-9, 6)}

STEPHANIE

x	-4	0	7	-4
y	6	0	-2	-6

WHAT IS THE ONLY NUMBER WHOSE LETTERS ARE IN ALPHABETICAL ORDER?

_____

multiple representations

LINEAR RELATIONSHIPS

a 14 day TEKS-aligned unit
TEKS: 8.4A-C, 8.5A-B, 8.5E-I, 8.9A

8th GRADE

streamline your planning process with unit overviews

✓ key vocabulary

✓ vertical alignment

sample pacing calendar

teaching ideas

LINEAR RELATIONSHIPS
OVERVIEW

READINESS STANDARDS

8.4B Graph proportional relationships, interpreting the unit rate as the slope of the line that models the relationship.

8.4C Use data from a table or graph to determine the rate of change or slope and y-intercept in mathematical and real-world problems.

8.5G Identify functions using sets of ordered pairs, tables, mappings, and graphs.

8.5I Write an equation in the form y = mx + b to model a linear relationship between two quantities using verbal, numerical, tabular, and graphical representations.

SUPPORTING STANDARDS

8.4A Use similar right triangles to develop an understanding that slope, m, given as the rate comparing the change in y-values to the change in x-values is the same for any two points on the same line.

8.5A Represent linear proportional situations with tables, graphs, and equations in the form of y = kx.

8.5B Represent linear non-proportional situations with tables, graphs, and equations in the form of y = mx + b, where b ≠ 0.

8.5E Solve problems involving direct variation.

8.5F Distinguish between proportional and non-proportional situations using tables, graphs, and equations in the form y = kx or y = mx + b, where b ≠ 0.

BIG IDEAS

- Functional relationships e...
- Linear relationships can b... descriptions.
- Linear relationships are ei...

LINEAR RELATIONSHIPS UNIT
PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Identifying Functions	Slope and Rate of Change	The Slope Formula	Functions and Slope Mini-Quiz	Slope-Intercept Form: Part I
Student Handout 1 Homework 1	Student Handout 2 Homework 2			
DAY 6	**DAY 7**			
Slope-Intercept Form: Part II	Multiple Representations			
Student Handout 5 Homework 5	Student Handout 6 Homework 6			
DAY 11	**DAY 12**			
Direct Variation	Linear Relationships Mini-Quiz			
Student Handout 9 Homework 9	Mini-Quiz 2			

LINEAR RELATIONSHIPS UNIT
OVERVIEW

TOPIC	TEACHING TIPS
Identifying Functions	• An analogy I like to give students is a vending machine. A "functioning" vending machine means that for any button I press, only one item should dispense. There can be more than one button for a particular item, but any chosen button (input) should only dispense one particular item (output).
Slope and Rate of Change	• Have students draw the side view of a steep ramp and the side view of a ramp that isn't very steep. Allow students to discuss what makes one ramp steeper than the other and emphasize the differences in the vertical change over the horizontal change.
Slope-Intercept Form	• Search "Linear Equations" on www.Flocabulary.com for a related video. • To help students remember "b" is the y-intercept, use alliteration to say that "b" represents "begin".
Systems of Equations	• While the 8th TEKS doesn't specify that students must graph the two equations themselves, consider extending the lesson by having students practice graphing to reinforce and increase their mastery of the concepts of slope and y-intercept.
Proportional and Non-Proportional Relationships	• An easy question students can ask to see if a situation is proportional is, "As one quantity doubles, does the other quantity double?" If the answer is yes, the relationship is proportional.
Direct Variation	• In the equation y = kx, I tell students to think of "k" making the same sound as the c in "constant of proportionality" in order to help them remember the meaning of the variable "k."

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LINEAR RELATIONSHIPS

8th GRADE

unit study guide + assessments

✓ **quizzes**

✓ **editable unit test**

Unit: Linear Relationships
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: FUNCTIONS, SLOPE AND SLOPE-INTERCEPT FORM

	Answers
	1. _____
	2. _____
	3. _____
	4. _____

1. Kayla thinks that the slope of a vertical line is undefined, while Joshua argues that the slope of a vertical line is zero. Who is correct?

2. Find the rate of change shown in the table.

x	y
1	-3
2	-9
3	-15
4	-21

3. Find the slope of the graph.

4. Which of the following triangles could ... question #3?

A. [triangle with 44 and 21] B. [triangle with 36 and 12] C.

5. A line has a slope of zero. Which of the following points could this line pass through...

A. (12, 9) and (12, 6)

B. (3, -6) and (7, -6)

C. (1, 4) and (2, 5)

D. (-9, 7) and (9, -7)

Unit: Linear Relationships
Review

Name _____
Date _____ Pd _____

LINEAR RELATIONSHIPS STUDY GUIDE

Solve each of the problems below. These represent the types of questions on your test. Be sure to ask questions if you need more help with a topic.
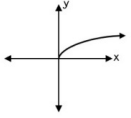
I CAN IDENTIFY FUNCTIONS.		8.5G
1. Does the set of ordered pairs represent a function? Explain. {(6, -6), (7, -6), (8, -6), (9, -6)}	2. Does the table represent a function?	3. Does the graph represent a function?
4. Does the graph represent a function? Explain.	5. ... a f...	6.

I CAN DETERMINE SLOPE AND RATE OF ...		
7. Find the rate of change from the table.	x	y	8.	

x	y
-3	10.5
-2	7
-1	3.5
0	0

EIGHTH GRADE CURRICULUM

LINEAR RELATIONSHIPS

UNIT THREE: ANSWER KEY

answer keys included

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