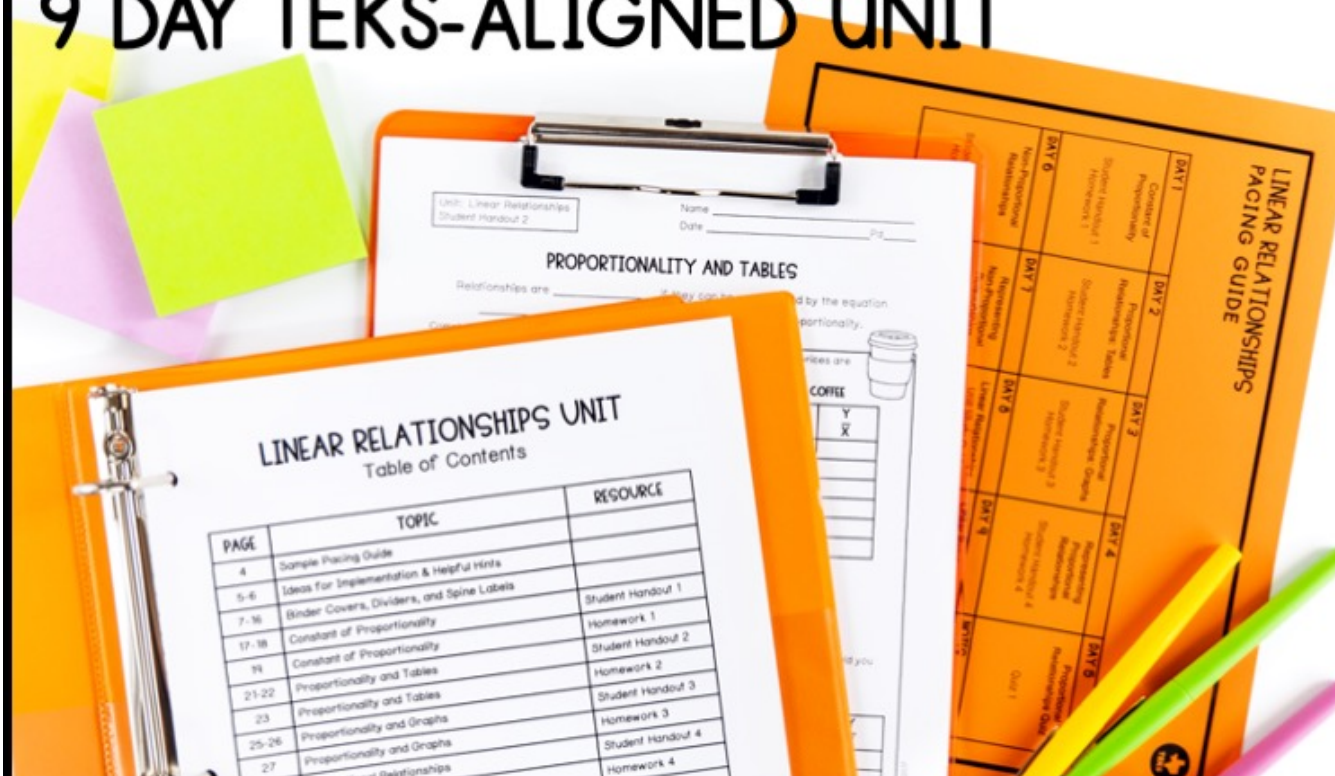


learning focus:

- ✓ represent proportional relationships in mathematical and real-world problems
- ✓ determine the constant of proportionality
- ✓ represent linear relationships using verbal descriptions, tables, graphs, and equations

LINEAR RELATIONSHIPS UNIT

9 DAY TEKS-ALIGNED UNIT



A MANEUVERING THE MIDDLE® RESOURCE

LINEAR RELATIONSHIPS



a 9 day TEKS-aligned unit
TEKS: 7.4A, 7.4D, 7.7A

ready-to-go, scaffolded
student materials

LINEAR RELATIONSHIPS UNIT

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LINEAR RELATIONSHIPS



a 9 day TEKS-aligned unit
TEKS: 7.4A, 7.4D, 7.7A

student friendly + real-world application

multiple representations

Unit: Linear Relationships
Student Handout 5

Name _____
Date _____ Pd _____

NON-PROPORTIONAL RELATIONSHIPS

Fit Life Gym charges customers for each month of membership as shown in the table. Use the information to complete a-b.

# OF MONTHS	0	1	2	3
TOTAL COST (\$)	10			

a. Sketch a graph to show the relationship between the cost of the gym, y , and the number of months, x .
b. Is the relationship between the number of months and the total cost proportional? Explain.

A relationship is non-proportional if the ratio of y to x is not constant.

NON-PROPORTIONAL

TABLES:

- The ratio of _____ is not constant.
- Does not contain the point _____ but in _____ when x is 0, y is a nonzero constant _____

EX:

x	0	1	2	3
y	9	11	13	15

For 1-2, complete the graph to represent the relationship.

1. The table shows the cost in dollars of jumping at Terrific Trampolines, y , in relation to the hours of jumping, x .

HOURS	COST (\$)
0	6
1	8
2	10
3	12

How can you determine the rate of change?

For 3-5, use your understanding of non-proportional relationships to answer each question.

3. At Pizza Palace, Rasheed orders a pizza that costs \$8.00 plus \$2.00 per topping. Complete each representation to show the relationship between the number of toppings, x , and the cost of the pizza, y . Then answer a-d.

TOPPINGS	PROCESS	COST (\$)
0		
1		
2		
3		
4		

EQUATION: _____

a. What is the initial value, or the cost of the pizza with 0 toppings?
b. Where do the initial values of each representation meet?

4. Mr. Tien asked his students to write an equation for the relationship shown in the graph. Use the graph to complete the table.

5. Draw a line to match each equation with the graph above.

$y = 0.5x + 6$

$y = 4x + 6$

$y = 5x + 3$

Unit: Linear Relationships
Homework 5

Name _____
Date _____ Pd _____

NON-PROPORTIONAL RELATIONSHIPS

Three statements were made about each non-proportional relationship shown. Two are true and one is false. Mark each statement as true or false and rewrite the false statement to make it true.

1. A travel agency charges customers to book train tickets as shown.

# OF TICKETS	TOTAL COST
0	\$25
2	\$125
4	\$225
6	\$325
8	\$425

STATEMENT	T/F?
The travel agency charges a flat booking fee of \$25.	
The rate of change is \$100 and represents the amount each ticket costs.	
The situation can be represented by the equation $y = 50x + 25$, where y is the total cost and x is the number of tickets purchased.	

REWRITE THE FALSE STATEMENT TO MAKE IT TRUE: _____

2. The graph shows the relationship between x and y -values.

STATEMENT	T/F?
The y -intercept is at -1.	
The rate of change is 2.	
The graph can be represented by the equation $y = 2x + 1$.	

REWRITE THE FALSE STATEMENT TO MAKE IT TRUE: _____

3. A snorkeling company charges tourists \$30 for the snorkeling gear and \$11 per hour of snorkeling. Let y be the total cost and x be the number of hours spent snorkeling.

STATEMENT	T/F?
The situation can be represented by the equation $y = 11x + 30$.	
If a tourist snorkels for 4 hours, it will cost \$44.	
The rate of change in this situation is 11, and it represents the cost of each hour of snorkeling.	

REWRITE THE FALSE STATEMENT TO MAKE IT TRUE: _____

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skill application

LINEAR RELATIONSHIPS



a 9 day TEKS-aligned unit
TEKS: 7.4A, 7.4D, 7.7A

streamline your planning process with unit overviews

LINEAR RELATIONSHIPS OVERVIEW

READINESS STANDARDS

7.4A Represent constant rates of change in mathematical and real world problems given pictorial, tabular, verbal, numeric, graphical, and algebraic representations, including $d=rt$.

7.7A Represent linear relationships using verbal descriptions, tables, graphs, and equations that simplify to the form $y=mx+b$.

SUPPORTING STANDARDS

7.4C Determine the constant of proportionality ($k=y/x$) within mathematical and real-world problems.

- ✓ key vocabulary
- ✓ vertical alignment

BIG IDEAS

- Real world relationships can...
- Not all linear relationships h...

ESSENTIAL QUESTIONS

- What pattern do you notice?
- How can you express a patt...
- How does a pattern support...
- How can a real world situati...

LINEAR RELATIONSHIPS PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Constant of Proportionality	Proportional Relationships: Tables	Proportional Relationships: Graphs	Representing Proportional Relationships	Proportional Relationships Quiz
Student Handout 1 Homework 1	Student Handout 2 Homework 2			
DAY 6	DAY 7			
Non-Proportional Relationships	Representing Non-Proportional Relationships			
Student Handout 5 Homework 5	Student Handout 6 Homework 6			

sample pacing calendar

teaching ideas

LINEAR RELATIONSHIPS OVERVIEW

TOPIC	TEACHING TIPS
Constant of Proportionality	• Begin class by asking students to predict what the term proportional means. Try and get them to connect the term proportional to the concept of a proportion. Share with students that just like a proportion, the constant of proportionality changes at a constant rate.
Proportional Relationships: Tables	• List three different tables on the board, one that does not have a proportional relationship and two that do have a proportional relationship. Ask students to predict which ones are proportional based on yesterday's lesson. At the end of the lesson return to the various predictions and discuss.
Proportional Relationships: Graphs	• Students are going to want each graph to go through a perfect intersection on the graph. Help students to use their reasoning skills to find at least two points that are easy to read.
Representing Proportional Relationships	• The unit should really start to come together here, as students will see how one relationship can be represented in multiple ways.
Non-Proportional Relationships	• Prep two envelopes: one without anything in it and the other with a card that states "5 extra pushups" • Ask two students to come to the front of the class and give them an envelope. Then, divide the class into two teams. For each simple math fact (i.e. $2+2$) that the team gets correct the student has to do two push ups. Continue for about 10 pushups. Ask students to describe the type of relationships and the constant of proportionality between math facts and pushups. Sketch the table and graph on the board if necessary. Then, have the students open the envelopes and complete the number that is inside. Tie the "5 extra pushups" to the "b" in the linear relationship.
Representing Non-Proportional Relationships	• Using student whiteboards share one representation of a linear relationship. Ask students to choose another representation to sketch.

LINEAR RELATIONSHIPS



a 9 day TEKS-aligned unit
TEKS: 7.4A, 7.4D, 7.7A

unit study guide + assessments

- ✓ quizzes
- ✓ editable unit test

Unit: Linear Relationships
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: PROPORTIONAL RELATIONSHIPS

Use the table below to answer questions 1-4.

MINUTES	0	3	6	9	12
WORDS TYPED	0	120	?	360	480

1. Kenry is practicing for a typing test for 18 minutes. The number of words he can type is proportional to the number of minutes he types. If the test is 18 minutes long, how many words can he type?

2. What number is missing in the table above?

3. Which number represents k , the constant of proportionality?

a. 120
b. 60
c. 40
d. 12

Answer the following questions. Be sure to show your work.

5. Jermaine plots the points $(0, 0)$ and $(4, 12)$ on a graph to represent a proportional relationship. Which of the following equations represents the relationship between the x and y -values?

a. $y = \frac{4}{11}x$ b. $y = 2.75x$
c. $y = 0.36x$ d. $11y = 4x$

Unit: Linear Relationships
Review

Name _____
Date _____ Pd _____

LINEAR RELATIONSHIPS UNIT 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 DETERMINE IF A RELATIONSHIP IS PROPORTIONAL. 7.4C

1. Determine if the representations below are proportional.

a.

x	2	4	6
y	5	9	13

b.

x	3	5	7
y	1.5	2.5	3.5

c. $y = 9x + \frac{1}{2}$

d. $y = \frac{3}{4}x$

I CAN FIND THE CONSTANT OF PROPORTIONALITY. 7.4D

2. Determine the constant of proportionality for each relationship.

a. $y = 8x$

$k =$ _____

b.

x	2	4	6	8
y	190	380	570	760

$k =$ _____

c. A restaurant has an all-you-can-eat buffet. They charge \$13.95 per person.

$k =$ _____

SEVENTH GRADE CURRICULUM

LINEAR RELATIONSHIPS

UNIT FOUR: ANSWER KEYS

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answer keys included