learning focus:

✓ **differentiate between multiplicative and additive relationships**

✓ **identify independent and dependent quantities from tables and graphs**

✓ **represent situations using verbal descriptions, tables, graphs, and equations**

ALGEBRAIC REPRESENTATIONS UNIT
8 DAY TEKS-ALIGNED UNIT

6th GRADE

ALGEBRAIC REPRESENTATIONS UNIT
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ALGEBRAIC REPRESENTATIONS
PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4
Review of Graphing and Tables	Multiplicative Relationships	Additive Relationships	Multiplicative vs.

Student Handout 5
Homework 1

DAY 6
Independent and Dependent Variables

VE RELATIONSHIPS

games to play. Each game requires a
ded in for prizes before leaving the

TASK 1:
two machines below. They determine
n tickets based on different patterns.
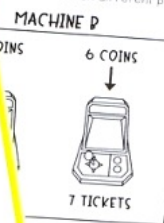
MACHINE B

OINS → 6 COINS

7 TICKETS

coins did they play?
ven when coins, c,

A MANEUVERING THE MIDDLE ® RESOURCE

ALGEBRAIC REPRESENTATIONS

6th GRADE

ready-to-go, scaffolded student materials

ALGEBRAIC REPRESENTATIONS UNIT
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ALGEBRAIC REPRESENTATIONS

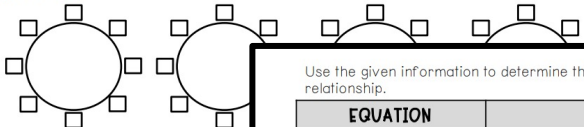6th GRADE

student friendly + real-world application

multiple representations

Unit: Algebraic Representations
Student Handout 2

Name _____
Date _____ Pd _____

MULTIPLICATIVE RELATIONSHIPS

An event planner is organizing the seating chart at a wedding reception. She has drawn the diagram below.

a. Describe the ratio of tables to chairs

b. If the wedding now needed six tables,

MULTIPLICATIVE RELATIONSHIPS

- A multiplica

  - y – r
  - x – r
  - a – r

- The a-value
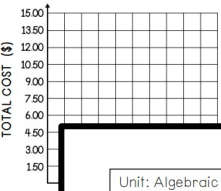 a multiplica

In the tables below, complete the proces equation in the form y = ax.

TABLE 1

X	PROCESS	Y
2		8
3		12
4		16
5		20
6		24

A= ____ EQUATION = _____

graphic organizers

Use the given information to determine the missing representations for each multiplicative relationship.

EQUATION	GRAPH	TABLE
DESCRIPTION The cost of an ice cream cone is $1.50.	TOTAL COST ($) 15.00 13.50 12.00 10.50 9.00 7.50 6.00 4.50 3.00 1.50	

EQUATION	
y = 7x	
DESCRIPTION	

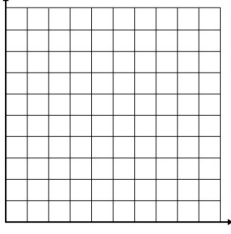| EQUATION	
DESCRIPTION	MILES TRAVELED 200 180 160 140 120 100 80 60 40 20

Summarize today's lesson:

Unit: Algebraic Representations
Homework 2

Name _____
Date _____ Pd _____

MULTIPLICATIVE RELATIONSHIPS

Use your understanding of multiplicative relationships to answer the questions below.

1. The Suarez family travels 70 miles per hour on their family road trip. Represent the number of miles traveled with *m*, and time with *t*.

a. Complete the table below.

T				
M				

b. Write an equation to describe the situation.

c. Graph the situation below.

2. The number of cupcakes sold at Woops Bakery is displayed in the graph below.

TOTAL INCOME: 70 63 56 49 42 35 28 21 14 7
NUMBER OF CUPCAKES: 2 4 6 8 10 12 14 16 18 20

a. Complete the table below.

b. Write an equation to describe the situation.

3. The table shows the relationship between the number of hours worked and the total earnings. Which equation best represents the relationship in the table?

# OF HOURS (H)	1	2	3	4	5
TOTAL EARNINGS (T)	12	24	36	48	60

A. h = 12t   B. t = 12h

C. h = $\frac{c}{12}$ D. c = $\frac{h}{12}$

4. The movie theater sells a bucket of popcorn, *p*, for $5.95 each each. Which of the following equations best represents *c*, the total cost of purchasing buckets of popcorn?

A. c = 5.95p

B. p = 5.96c

C. c + 5.95 = p

D. p + c = 5.95

POP CORN

A MANEUVERING THE MIDDLE® RESOURCE

ALGEBRAIC REPRESENTATIONS

an 8 day TEKS-aligned unit
TEKS: 6.4A, 6.6A, 6.6B, 6.6C, 6.11A

streamline your planning process with unit overviews

✓ key vocabulary

✓ vertical alignment

sample pacing calendar

teaching ideas

ALGEBRAIC REPRESENTATIONS
OVERVIEW

READINESS STANDARDS

6.6C Represent a given situation using verbal descriptions, tables, graphs, and equations in the form y = kx or y = x + b.

6.11A Graph points in all four quadrants using ordered pairs of rational numbers. *(More formally included in Unit 9 Geometry)*

SUPPORTING STANDARDS

6.4A Compare two rules verbally, numerically, graphically, and symbolically in the form of y = ax or y = x + a in order to differentiate between additive and multiplicative relationships.

6.6A Identify independent and dependent quantities from tables and graphs.

6.6B Write an equation that represents the relationship between independent and dependent quantities from a table.

BIG IDEAS

- Mathematical relationships descriptions.
- Additive relationships do n through the origin.

ESSENTIAL QUESTION

- How can a situation be rep
- What differences are there

ALGEBRAIC REPRESENTATIONS
PACING GUIDE

DAY 1	DAY 2	DAY 3	DAY 4	DAY 5
Review of Graphing and Tables	Multiplicative Relationships	Additive Relationships	Multiplicative vs. Additive Relationships	Algebraic Representations Quiz
Student Handout 1 Homework 1	Student Handout 2 Homework 2			

DAY 6	DAY 7	
Independent and Dependent Variables	Algebraic Representations Unit Study Guide	
Student Handout 5 Homework 5	Unit Study Guide	

ALGEBRAIC REPRESENTATIONS
OVERVIEW

TOPIC	TEACHING TIPS
Review of Graphing and Tables	• Using masking tape or painter's tape, create a life-sized coordinate plane and have students practice finding ordered pairs and giving directions to each other. Online, I have seen this idea created on a white shower curtain so it can be moved. For a more technologically-friendly idea, consider projecting the coordinate plane and using magnets. • If you feel confident that your students are successful with this concept, then you could have them plot a picture on a page, get with a partner, and swap directions.
Multiplicative Relationships	• For some reason, multiplicative relationships are slightly more intuitive to students. I really like asking students to create the process column when working with tables, so they can see the consistency in "a," when y = ax. • Project four different languages all saying the word "hello." You could even use a translator app to have the word read aloud. Then, help students to understand that the words all mean the same thing. The biggest takeaway here is to ensure that students understand that each of these relationships (verbal, equation, graph, table) can be represented in different ways.
Additive Relationships	• Additive relationships can be more confusing because they do not go through the origin and thus do not have the ordered pair (0, 0). Students must be able to find out what the y-value is when x is zero. This value will represent "a" when y = x + a.
Independent and Dependent Variables	• In science class, many teachers use the acronym DRY MIX. This really helps students to keep independent and dependent variables organized in their minds. • D – dependent • R – responsive • Y – y-values • M – measured • I – independent • X – x-values

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ALGEBRAIC REPRESENTATIONS

6th GRADE

unit study guide + assessments

✓ **quizzes**

✓ **editable unit test**

Unit: Algebraic Representations
Quiz 1

Name _____
Date _____ Pd _____

QUIZ: ALGEBRAIC REPRESENTATIONS

Answer each of the questions below. Be sure to show your work.

Answers
1. _____
2. _____
3. _____

1. Each small moving box, m, costs $1.25. Which of the following equations best represents the cost, c, of buying m, moving boxes?

   A. $m = 1.25c$ B. $c = m + 1.$

   C. $m = c + 1.25$ D. $c = 1.25m$

2. Groceries are delivered by a local ser
equation below.

$$c = g + 5.7$$

Which table correctly displays the values

A.	G	C		B.	G	C	
	15	86.25			15	20.75	
	18	103.5			18	23.75	
	21	120.75			21	26.75	
	24	138			24	29.75	
	27	155.25			27	32.75	

3. Which statement best describes the re

   A. The value of y is six less than the v
   B. The value of y is six times the valu
   C. The value of x is six more than the
   D. The value of y is six more than the

4. Which statement is **not** true in the equa

   A. The value of y is nine times the va
   B. The equation represents an additiv
   C. The value of y is 76.5 when the va
   D. The equation represents a multipli

Unit: Algebraic Representations
Review

Name _____
Date _____ Pd _____

ALGEBRAIC REPRESENTATIONS 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 DIFFERENTIATE BETWEEN ADDITIVE & MULTIPLICATIVE RELATIONSHIPS.   6.4A

Label each of the following as an ad

1.
   $$y = 7x$$

2.
   $$y = x - 7$$

3. All of Mrs. Palmer's students stood on a 12-inch stool to take class pictures. The height of each student on the stool was represented by t, while their actual height was represented by h.

4.

5.

I CAN IDENTIFY INDEPENDENT & D

6.

TOTAL ALLOWANCE (y-axis: 6, 12, 18, 24, 30)
NUMBER OF WEEKS (x-axis: 2, 4, 6, 8, 10)

7.
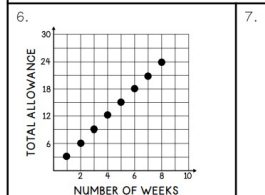
Independent quantities: _____   Ind
Dependent quantities: _____   Dep

SIXTH GRADE CURRICULUM

ALGEBRAIC REPRESENTATIONS

UNIT EIGHT: ANSWER KEYS

answer keys included

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