RATIOS UNIT

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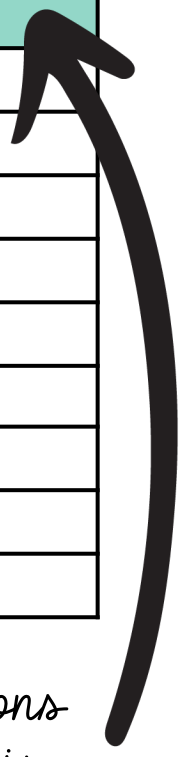

highlighted selections are included in this sample

RATIOS
Student Handouts

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STANDARDS

6.RP.1 Understand the concept of a ratio and use ratio language to describe ratio relationships between two quantities.

6.RP.3 Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

6.RP.3b Make tables of equivalent ratios relating quantities with whole number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

Included in this unit you will find the following:

Unit Overview
a sample pacing calendar, ideas and tips for teaching/introducing the concepts, unit vocabulary, big ideas, vertical alignment, and common misconceptions

Student Handouts
student-friendly notes and practice problems, homework/independent practice, quizzes, unit review, and unit assessment

Student Handouts as Google Slides
a Google Slide version of the unit (excluding assessments)

Answer Keys
an answer key for each page of the unit

Editable Unit Assessment
a PPT file of the unit test has been provided for you to make modifications

Need to get in touch? Please direct all questions to contact@maneuveringthemiddle.com.

Unit: Ratios
Student Handout 2

Name _____

Date _____ Pd_____

EQUIVALENT RATIOS

EQUIVALENT RATIOS

- Ratios that are equivalent can be simplified to the same _____, just like an equivalent fraction.
- Ex: 4:5, 8:10, 12:15 $\frac{1}{6}, \frac{2}{12}, \frac{3}{18}$

SCALE FACTOR

- The _____ or _____ in which both numbers in a ratio are multiplied by to form an equivalent ratio.

$\frac{2}{5} \cdot \square = \frac{8}{20}$ $\frac{2}{5} = \frac{8}{20}$

Create two ratios that are equivalent to the ratios below.

1.	2.	3.
3:11	18:12	6:10

Determine if the ratios below are equivalent. If so, determine the multiplier or scale factor.

4.	5.	6.
$\frac{2}{5}$ and $\frac{8}{20}$	$\frac{12}{4}$ and $\frac{6}{3}$	$\frac{8}{6}$ and $\frac{20}{15}$
_____	_____	_____
_____	_____	_____

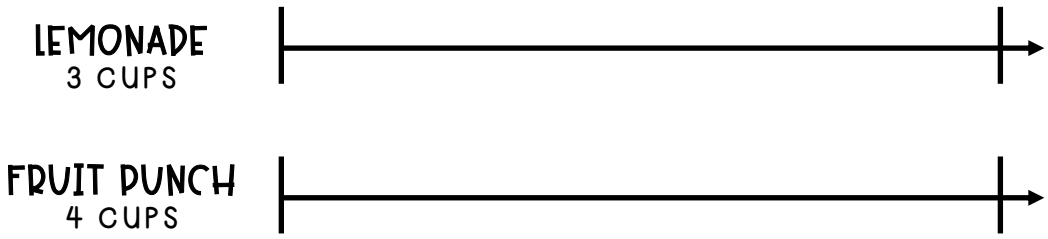
Audrey and Megan are decorating for a birthday party. Audrey hangs 4 streamers in the same amount of time that Megan hangs 6. If Audrey hangs 12 streamers, then how many streamers can Megan hang? Determine the scale factor.

AUDREY
4 STREAMERS

MEGAN
6 STREAMERS

_____ = _____

7. Sally's Summer Punch recipe is a combination of lemonade and fruit punch. Sally uses 3 cups of lemonade for every 4 cups of fruit punch. In order to make a batch for the Fourth of July party, Sally uses 21 cups of lemonade. How many cups of fruit punch will Sally use?



Use your understanding of equivalent ratios to answer the questions below.

8. Use the pattern below to determine how many gray squares there would be if there are 15 white squares.

9. Mrs. Malone earns two hours of paid vacation for every 9 days she works. How many hours of paid vacation will Mrs. Malone earn after working 81 days?

10. A wrapping paper fundraiser sells rolls of gold and red wrapping paper. The ratio of gold rolls sold to red rolls sold is 5:8. If the school sells 78 rolls, then how many were gold?

11. There are a total of 30 puzzle pieces. Three out of 5 are red, the remaining are black. How many puzzle pieces are black?

12. Jamal says that 18:12 and 3:4 are not equivalent ratios. Margie says they are equivalent ratios. Who is correct? Justify your solution.

_____

_____

_____

Summarize today's lesson:

Unit: Ratios
Homework 2

Name _____

Date _____ Pd_____

EQUIVALENT RATIOS

Determine if the ratios below are equivalent or not. Justify your reasoning.

1.	2.	3.
4:18 and 2:12	5:20 and 15:60	17:3 and 68:12
_____	_____	_____
_____	_____	_____

Use your understanding of equivalent ratios to answer the questions below.

4. A toy shop sells baby rattles in green and yellow. For every two green rattles the toy shop sells, it sells 7 yellow rattles. If the company sells 108 rattles, how many yellow rattles did they sell?

5. A French toast recipe uses 2 eggs to make 14 slices of French toast. Brenda wants to make 98 slices of French toast to feed her family and friends. How many eggs will Brenda need to make 98 slices?

6. Olumide plays the piano and guitar. For every 5 minutes of piano practice, he spends 8 minutes practicing guitar. How many minutes will Olumide practice piano if he spends 64 minutes practicing guitar?

7. At Doggy Daycare, there are 3 trainers assigned for every 12 dogs. There are 72 dogs enrolled for the daycare on Tuesday. Determine the number of trainers needed.

8. Maia was baking cupcakes for a party. She mixed 4 drops of red food coloring for every 6 drops of yellow food coloring to dye her icing orange. Circle the ratios of food coloring drops that would create the same orange color and justify your choices.

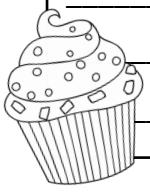
2 red to 3 yellow **40 yellow to 100 red** **44 red to 66 yellow**

24 red to 26 yellow **28 red to 42 yellow**

_____

_____

_____



Unit: Ratios
Student Handout 3

Name _____

Date _____Pd_____

RATIO TABLES

A ratio _____ is a way to _____ quantities.

1. Todd earns $3 for every 5 chores he completes on his chore chart. Find equivalent ratios using the ratio table below.

CHORES	TOTAL ($)		RATIO CHORES TO TOTAL
		→	
		→	
		→	
		→	
		→	

a. How are the number of chores and the amount of money earned related? _____

_____

b. How are the values in the chores column related? _____

_____

c. How are the values in the total column related? _____

_____

d. What do you notice about the ratio column? _____

_____

2. Mr. Baker is making pancakes and reads the recipe on the back of the pancake box. Use the information in the table to determine the ratio of the cups of pancake mix to cups of water.

CUPS OF PANCAKE MIX	1	2	3	4	5	6
CUPS OF WATER	1.5	3	4.5	6	7.5	9

a. What is the constant ratio?

b. How many cups of pancake mix will be needed if there are 15 cups of water?

In questions 3-4, complete the ratio table, and then answer the questions below.

3. A cookie recipe calls for 3 eggs for every 2 dozen cookies.

EGGS				
COOKIES (DZ)				

a. How many cookies can be made with 12 eggs?

b. How many eggs will be needed for 60 dozen cookies?

4. A developer earns $6.00 for every 21 apps downloaded.

APPS				
$ EARNED				

a. How many apps will need to be downloaded in order to earn $84?

b. How much money will the developer earn when 105 apps are downloaded?

Use your understanding of ratios and ratio tables to answer the questions below.

5. The relationships between the number of babies to the number of nursery workers is shown in the table below.

BABIES	WORKERS
5	2
10	4
15	6
20	8

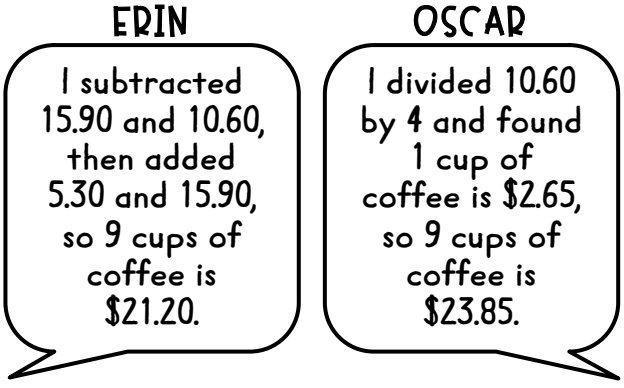
a. What is the ratio of babies to nursery workers?

b. How many nursery workers are required if there are 35 babies?

c. If seven nursery workers are available, then what is the maximum number of babies that they can accept?

6. Ms. Halpert wrote the table on the board and asked for her students to find the missing value. Who found the correct missing value?

# OF CUPS OF COFFEE	COST ($)
4	10.60
6	15.90
9	?
12	31.8



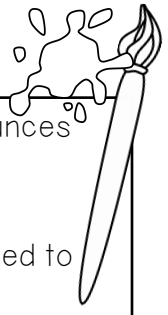
Summarize today's lesson:

Unit: Ratios
Homework 3

Name _____

Date _____Pd_____

RATIO TABLES



Use your understanding of ratio tables and graphs to answer the questions below.

1. An artist mixes yellow and blue paint to make the perfect shade of green. She uses 2 ounces of blue paint for every 7 ounces of yellow.

BLUE	YELLOW		RATIO
		→	
		→	
		→	
		→	
		→	

a. How many ounces of yellow will the artist need to add to 12 ounces of blue?

b. The artist realizes she has 49 ounces of yellow left. How many ounces of blue will she need to add?

c. If the mixing container only holds 40 ounces of paint, what is the most green paint the artist can make, and what recipe should she use?

2. Mark owns a personal training business. He makes a total of $500 for every 3 clients he acquires.

# OF CLIENTS	TOTAL $		RATIO
		→	
		→	
		→	
		→	

a. If Mark is saving to purchase $2,500 in new equipment, how many clients will he need?

b. How much money will 21 clients bring in?

c. Mark hopes to one day earn $10,000. Predict how many clients Mark would need to train.

3. Alexander has a collection of baseball cards he wants to organize into a book. Use the table to determine how many pages he will need to hold 234 cards.

PAGES	3	6	9	12
CARDS	18	36	54	72

Unit: Ratios
Student Handout 4

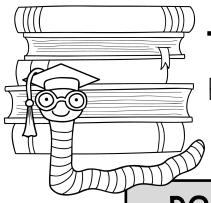
Name _____

Date _____Pd_____

COMPARING RATIO TABLES

INTRODUCTION

Several students are participating in a reading challenge at West Middle School. They earn points for the number of books they read, improving their reading speed, and for reading to younger students. As the grade levels increase, the point values change. Complete each of the following tasks by applying your understanding of ratios and ratio tables.



TASK 1:

Each grade is given a different number of points for each book read.

6TH GRADERS

BOOKS	POINTS
2	68
5	170
8	272
11	374
14	476

7TH GRADERS

BOOKS	POINTS
3	117
5	195
7	273
9	351
11	429

8TH GRADERS

BOOKS	POINTS
2	72
4	144
6	216
8	288
10	360

ANALYZE:

a. What do you notice that is different about these ratio tables?

b. How are the values in the books column displayed?

c. Write a ratio to compare the number of books read to the number of points earned for each grade level.

TASK 2:

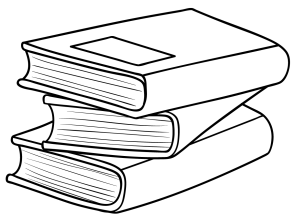
Two additional grade levels decided to participate, but their results were incomplete. Each grade level used a constant ratio. Use the information given to complete the tables below. Which grade level earns points the fastest? Justify your thinking.

5TH GRADERS

BOOKS	POINTS
3	
4	168
	294
10	
13	546

9TH GRADERS

BOOKS	POINTS
2	70
5	
8	280
	385
14	



TASK 3:

Students in each grade level earn points for the number of minutes they spend reading aloud to younger students. Use the tables below to answer the questions

6TH GRADERS

# OF MINUTES	# OF POINTS
10	2
20	4
30	6
40	8

7TH GRADERS

# OF MINUTES	# OF POINTS
15	3
45	9
75	15
105	21

8TH GRADERS

# OF MINUTES	# OF POINTS
25	5
50	10
75	15
100	20

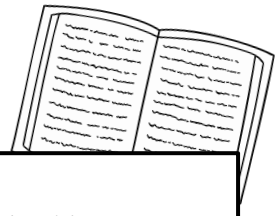
DISCUSS:

a. Determine the ratio of number of minutes read to number of points earned for each grade level.

b. Describe your process in answering the question above.

TASK 4:

Read each scenario below and use the information to complete the ratio table.



A

Edgar reads 78 books in 13 months.

1	
	24
	42
10	
13	78

B

In six minutes, Jocelyn reads 15 pages.

6	15
18	45
	60
	75

C

Wu reads 25 mysteries for every 20 science fiction books.

	4
	8
15	12
25	20

D

The library shelves contain 28 non-fiction books for every 80 fiction books.

7	
	40
	60
28	80
35	

Unit: Ratios
Homework 4

Name _____

Date _____Pd_____

COMPARING RATIO TABLES

Use the ratio tables below to answer questions 1-5.

ROBERT

MINUTES	WORDS
2	304
5	760
8	1,216
11	1,672
14	2,128

MICHAELA

MINUTES	WORDS
3	483
5	805
7	1,127
9	1,449
11	1,771

LAURA

MINUTES	WORDS
2	316
4	632
6	948
8	1,264
10	1,580

1. Who has a typing speed above 160 words per minute?

_____

2. How much faster does Laura type than Robert?

_____

3. Order the students' typing speeds from least to greatest.

_____

4. How long will it take Robert to type 2,508 words?

_____

5. If Robert, Michaela, and Laura all type for 20 minutes, how many fewer words will Laura type than Michaela?

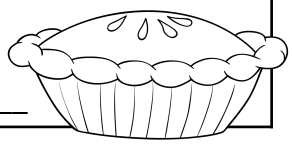
a. 3,160 words
b. 120 words
c. 60 words
d. 80 words

6. Millie's apple cobbler recipe uses 16 apples for 3 cobblers, while her peach cobbler recipe uses 8 peaches for 2 cobblers. Fill in the ratio tables below to find how many apples and peaches Millie will need to make 24 apple cobblers and 18 peach cobblers.

APPLES				
COBBLERS				

PEACHES				
COBBLERS				

_____



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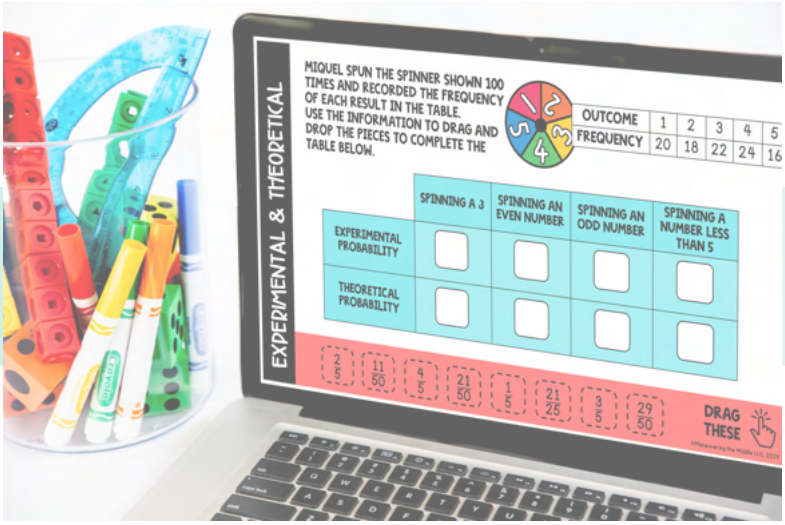

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