

Name \_\_\_\_\_

Date \_\_\_\_\_

Mr. Tallman

Math 7

**Lesson #21 - Ratios, Rates and Unit Rate**

**Recall:**

Reduce the following fractions.

A)  $\frac{4}{18} = \frac{2}{9}$

B)  $\frac{3}{12} = \frac{1}{4}$

C)  $\frac{18}{27} = \frac{2}{3}$

A **RATIO** is a comparison of 2 quantities.

Examples: Boys to girls

A **ratio** can be written 3 ways.  $\frac{\text{Boys}}{\text{Girls}}$  Boys: girls Boys to girls

Example 1) How many boys and girls are in the class? Boys: 12 Girls: 13

Write the ratio of boys to girls in three different ways.

**Word Ratio**

$\frac{\text{Boys}}{\text{Girls}}$

Fraction	"to"	Colon ":"
Boys $\frac{12}{13}$	12 to 13	12:13

What is the ratio of **boys to total students**?

\*\* Order IS VERY IMPORTANT WHEN WRITING RATIOS\*\*

• A **RATE** is a comparison of two quantities with different units.

• A **UNIT RATE** is a rate per 1 unit.

## How fast is our class?

Trial	# of Times Flipped	Time (in seconds)	Rate (flips per second)	Unit Rate
1	10	16.5	$\frac{10 \text{ flips}}{16.5 \text{ Sec.}}$	$\frac{0.625 \text{ flips}}{1 \text{ Sec}}$
2	10	20.6	$\frac{10 \text{ flips}}{20.6 \text{ Sec}}$	$\frac{0.49 \text{ flips}}{1 \text{ Sec}}$
3	10	17.3	$\frac{10 \text{ flips}}{17.3 \text{ Sec}}$	$\frac{0.58 \text{ flips}}{1 \text{ Sec}}$

\*\*What do you notice about the denominator of a unit rate? One

### Try It!

1) The ratio of the number of bananas to the number of apples at a fruit stand is 3:5. Write three ratios that is equivalent to 3:5.

$$\frac{3 \times 2}{5 \times 2} \quad \frac{6 \times 2}{10 \times 2} \quad \frac{12 \times 2}{20 \times 2} \quad \frac{24}{40}$$

#2-3: A basket of fruit contains 6 apples, 4 bananas, and 3 oranges.

2) What is the ratio of bananas to apples? (in simplest form).

$$4:6 \quad \frac{4}{6}$$

$$2:3 \quad \frac{2}{3}$$

3) What is the ratio of oranges to total pieces of fruit (in simplest form)?

$$3:13 \quad \text{or} \quad \frac{3}{13}$$

4) Complete the table below. Find the unit rate.

	Rate	Unit Rate
180 miles in 3 hours	$\frac{180 \text{ mi}}{3 \text{ hrs}}$	$\frac{60 \text{ mi}}{1 \text{ hr}}$

5-7: Classify each rate. Write **unit rate** or **not unit rate**.

5) 3 feet per minute <u>Unit rate</u>	6) 4 miles every $\frac{1}{2}$ hour <u>Not unit rate</u>	7) \$1.69 per pound <u>Unit rate</u>
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8) Mr. Campbell has 15 tests and 12 quizzes to return. Ms. Smith has 45 tests and 48 quizzes to return. For each teacher, write a ratio to represent the number of tests to the number of quizzes they have to return. Are the ratios equivalent? Explain.

Mr. Campbell:  $15:12 = 5:4$

Ms. Smith:  $45:48 = 15:16$

They are not equivalent because they don't simplify to the same ratio.

9) James has quite a bit of free time each day. He often spends 4 hours on the computer and the other 2 hours playing basketball. What is his ratio of basketball to computer time?

$2 \text{ hrs} : 4 \text{ hrs}$

10) Janice takes a 50 mile road trip and her car uses 3 gallons of gas. Mike takes a 160 mile road trip and uses 12 gallons of gas. Whose car gets better gas mileage? (HINT: FIND THE UNIT RATE)

$$\frac{\text{Janice}}{50 \text{ mi}} = \frac{16.67 \text{ mi}}{3 \text{ gal}}$$

$$\frac{\text{Mike}}{160 \text{ mi}} = \frac{13.33 \text{ mi}}{12 \text{ gal}}$$

Scan Me for an Exit Ticket

Janice gets better mileage.



