Warm-Up   8/29/17

Unit Rates

1. If Asia bought 3 apples for 9 cents, how much will you pay for 1 apple? $\dfrac{9 \text{ cents}}{3 \text{ apples}} = 3 \text{ cents per apple}$

2. If 192 students ride in 4 buses, what is the unit rate for this situation? $192/4 = 48$

Students per bus

Essential Questions   8/29/17

1.   How can a unit rate be used to answer questions about real world problems?

2.   How can I determine which unit rate is appropriate to solve a problem?

Home Work 8/29/17

Day 1 Unit Rates # 1 - 5

Notes in INB   8/29/17

RATIOS   RATES   PROPORTIONS

Definition:

A ratio is a ___Comparison___

of ___two___ or

more numbers.

Example:

☆ ☆ ◯ ◯ ◯

The ratio of stars to

circles is 2 to 3.

YOU SHOULD KNOW:

There are __3__ ways to

write a ratio.

1) $\frac{2}{3}$

2) 2 to 3

3) 2:3

Definition:

A rate is a ___*ratio*___ comparing two numbers with different ___*units*___.

Example:

A car travels 100 miles in 2 hours.

$$\frac{100 \text{ miles}}{2 \text{ hours}}$$

YOU SHOULD KNOW:

A ___*Unit*___ rate tells the rate in lowest terms, or the amount for ___*One unit*___.

Ex. $\dfrac{100 \text{ miles}}{2 \text{ hours}} = \dfrac{50 \text{ miles}}{1 \text{ hour}}$

Definition:

A proportion is an _____equation_____ showing two ratios are _____equal_____.

Example:

$$\frac{10}{25} = \frac{40}{100}$$

$$1000 = 1000$$

YOU SHOULD KNOW:

In a proportion, if the ratios are equivalent, then the _____cross_____ - _____products_____ are equal.

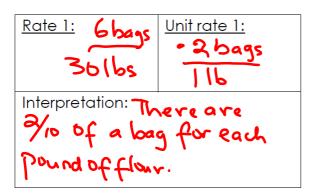*Think of equal fractions.*

Guided Practice Notes (INB)

Day 1: Unit Rates

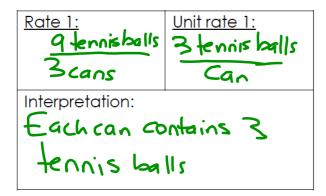**Part 1: Finding and Interpreting the Unit Rate**

In each problem, record both possible rates, use an appropriate strategy to find the unit rates, and then write a short sentence explaining each unit rate.

a. 6 bags of flour weigh 30 pounds.

Rate 1: $\dfrac{6\ bags}{30\ lbs}$	Unit rate 1: $\dfrac{.2\ bags}{1\ lb}$
Interpretation: There are 2/10 of a bag for each pound of flour.	

Rate 2: $\dfrac{30\ lbs}{6\ bags.}$	Unit rate 2: $\dfrac{5\ lbs}{1\ bag}$
Interpretation: There are 5 pounds of flour per bag.	

b. 9 tennis balls come in 3 cans.

Rate 1: $\dfrac{9\ \text{tennis balls}}{3\ \text{cans}}$	Unit rate 1: $\dfrac{3\ \text{tennis balls}}{\text{Can}}$
Interpretation: Each can contains 3 tennis balls	

Rate 2: $\dfrac{3\ \text{cans}}{9\ \text{tennis balls}}$	Unit rate 2: $\dfrac{0.33\ \text{cans}}{\text{tennis ball}}$
Interpretation: 1 tennis ball makes up 1/3 of a can.	

c. 5 gallons of gas cost $6.50.

Rate 1: $\dfrac{5\ \text{gallons of gas}}{\$6.50}$	Unit rate 1: $\dfrac{.77\ \text{gallon of gas}}{\$1}$
Interpretation: One dollar will buy .77 gallons of gas.	

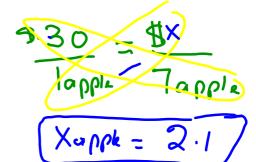| Rate 2: $\dfrac{\$6.50}{5\ \text{gallons of gas}}$	Unit rate 2: $\dfrac{\$1.30}{\text{gallon of gas}}$
Interpretation: $1.30 will buy 1 gallon of gas.	

Part 2: Selecting the Appropriate Unit Rate

At Ralph's fruit stand 3 apples cost $.90. You want to buy 7 apples. How much will they cost?

a. What are the two possible rates for this problem?

$$\frac{3 \text{ apples}}{\$.90} \quad or \quad \frac{\$.90}{3 \text{ apples}}$$

$$\frac{\$30}{1 \text{ apple}} = \frac{\$X}{7 \text{ apple}}$$

b. Show each rate as a unit rate.

$$\frac{3.33 \text{ apples}}{\$1} \quad or \quad \frac{\$.30}{\text{apple}}$$

$$X \cdot \text{apple} = 2 \cdot 1$$

c. What does each unit rate tell you?

3.33 apples can be bought with $1

1 apple can be bought for $.30.

d. Which unit rate will help you solve the problem?

e. Complete the table in order to determine the cost of seven apples. Then, describe the pattern you see.

Number of apples (n)	Cost C (in dollars)
1	.30
2	.60
3	.90
4	$1.20
5	$1.50
6	$1.80
7	$2.10

As the # of apples increase by one, the cost increase by $.30 cents.

f. Since you know the unit price, write a number sentence for the cost of seven apples. Write an equation for the cost of **any number** of apples using the variables in the table above.

$$7 \text{ apples} \times \frac{\$.30}{\text{apple}} = \$2.10 \text{ cents.}$$

$$C = .30n$$

Part 3: Applying the Unit Rate

In each problem, record the rate appropriate for the question asked, find the corresponding unit rate, write a short sentence interpreting the unit rate, and use this rate to find the solution to the problem.

a. Anne is painting her house light blue. To make the color she wants, she must add 3 cans of white paint to every 2 cans of blue paint. How many cans of white paint will she need to mix with 6 cans of blue?

Rate needed: $\dfrac{3 \text{ cans of white}}{2 \text{ cans of blue}}$ Unit rate: $\dfrac{1.5 \text{ cans of white}}{1 \text{ can of blue}}$

Interpretation of unit rate: Anne needs 1.5 cans of white paint for every can of blue paint.

Solution: 1.5×6

$= 9$ cans of blue paint

$\left.\begin{array}{l}1.5 \\ 1.5\end{array}\right\}3$
$\left.\begin{array}{l}1.5 \\ 1.5\end{array}\right\}3$
$\left.\begin{array}{l}1.5 \\ 1.5\end{array}\right\}3$

b. Ryan is making a fruit drink. The directions say to mix 5 cups of water with 2 scoops of powdered fruit mix. How many cups of water should he use with 9 scoops of fruit mix?

Rate needed: <u>5 cups of water</u>   Unit rate: <u>2.5 cups of water</u>
<u>2 scoops of kool-aid</u>   <u>1 scoop of kool-aid</u>

Interpretation of unit rate: <u>2.5 cups for 1 scoop of kool-aid</u>

Solution: <u>2.5 × 9 = 22.5</u>

c. Donna is running around a track. It takes her 10 minutes to run 6 laps. If she keeps running at the same speed, how long will it take her to run 5 laps?

Rate needed: _____   Unit rate: _____

Interpretation of unit rate: _____

Solution: _____

d. Carla is cleaning her classroom but decides to first help out her friends, Liz and Melissa, by cleaning both of their classrooms. It takes Carla $3\frac{1}{3}$ hours to clean both Liz and Melissa's classrooms. How long will she be working to clean all three classrooms?

Rate needed: _____   Unit rate: _____

Interpretation of unit rate: _____

Solution: _____