## Ratios

5-1

- I can write a ratio in simplest form, 3 different ways, to describe two quantities.
- I can draw a picture to match a quantity written as a ratio.
- I can explain the relationship that a ratio represents


## What is a ratio?

A RATIO is a comparison of two numbers by division.

| How do I write a ratio? Looks likc |  |  |  |
| :---: | :---: | :---: | :---: |
| Words <br> using the <br> word "to" | Colon <br> using the <br> symbol | Fractión <br> using a <br> fraction bar |  |
|  | $\vdots$ | - |  |

## Look around the classroom...

How many girls are in the classroom?


How many boys are in the classroom?

$$
18 \text { boys }
$$

How many girls \& boys are in the classroom?


```
3rd ~ 19:12
```


## Look around the classroom...

What is the ratio of girls to boys in the classroom?


What is the ratio of boys to giris in the classroom?

to


What is the ratio of girls to the total number of students in the classroom?


All Students
What is the ratio of boys to the total number of students in the classroom?

to


What is the ratio of green fish to orange fish?


What is the ratio of black fish to red fish?


## Explain What Ratios Represent

Begin with $\rightarrow$ "For Every..." Grammar Spelling
"For every...
Punctuation 27 students there are 2 teachers."
"For every...
15 ducks there were 7 turkeys."

Writing Ratios in Simplest Form
$\frac{6}{4} \frac{3}{2} 6$ chickens, 4 ducks, and 3 turkeys
What is the ratio of chickens to ducks?
Jor every 3 chicken there are 2 ducks, $\frac{6}{3} W^{2}$ hat is the ratio of chickens to turkeys?
Jorewry two chickens there is 1 turk
What is the ratio of ducks to all the birds?
for every 4 ducks there are thirteen
birds
*Remember start with "For Every..."

## RATIOS

Write the ratio 5:2 two other ways


## SIMPLIFYING Ratios

Reduce these ratios


## Rates \& Unit Rates

## 5-2

- I can write a unit rate for a real world problem.
- I can give examples of a unit rate.



## A rate is a ratio of two quantities

 measured in different units.What is the difference between a Ratio \& a Rate?


distance time Rate


## Ratios vs. Rates

Can you figure out which is a rate, and


Students in Band(to)Students in 6th Grade Retio

Can you think of a "trick" to help remember the difference between rates and ratios?


Unit Rate (Divide to get it):
$150 \div 2=75$ heartbeats per minute

| Unit | 75 heartbeats |
| :--- | :---: |
| Rate: | 1 minute |

A unit rates have a denominator of 1 unit

## Lets do this one!!!!

A store sells the same pasta two different ways: $\cdot 10$ pounds of bulk pasta for $\$ 15.00$ and

- 2 pounds of packaged pasta for $\$ 3.98$.

To determine which is the better buy, find the unit rate for both types.

Bulk Pasta
Packaged Pasta


A unit rates have a denominator of 1 unit


A unit rates have a denominator of 1 unit

## Proportions <br> 5-4

- I can use proportions to find missing values.


## What is a Proportion?

## An equation stating that two ratios are equal.

Proportions


Find the missing value ( $x$ ) multiply or divide


Find the missing value ( $x$ )

$$
\begin{aligned}
& \frac{3^{x 4}}{5}=\frac{12}{x} \quad \frac{x^{x}}{x-20}=\frac{5}{9} \\
& \frac{30^{2 x}}{x}=\frac{15}{21} \times=42 \pi=\frac{x=6}{3}\left(\frac{\pi}{12}\right)=\frac{x}{18} \\
& \left.\left.\frac{x}{15}=\frac{5}{25}\right) \frac{3}{7} \quad \frac{6}{74}\right)^{x 2}=\frac{x}{28} \\
& x=3 \\
& x=12
\end{aligned}
$$

Applying Proportions
If 2 apples cost $\$ 5$...


If a car travels at a constant speed of 45 miles in 50 minutes how many miles would it travel in 150 minutes?


How many minutes would it take to go 90 miles?


In a shipment of 100 parts, 7 are found to be defective. How many defective parts should be expected in a shipment of 1000 ?

$$
\frac{7}{100}_{\text {def }}^{\text {parts }}=\frac{x}{1000}_{\text {parts }}^{\text {def }}
$$

Zach can read 20 pages in 10 minutes. How long would it take him to read a 200 page book?

$$
\frac{20 \mathrm{pg}}{10 \mathrm{~min}}=\frac{200 \mathrm{pg}}{x}
$$

Justin Jones can run a mile in ten minutes. How long will it take Justin Jones to run 5 miles?

$$
\frac{1_{m i}}{10 \mathrm{~min}}=\frac{5 \mathrm{mi}}{x}
$$

Megan gets $\$ 15$ a week for doing her chores. How much will she make after 4 weeks of chores?

$=\frac{x}{4 \omega k s}$

## Proportions Day 2

Do the two ratios form a proportion (are the ratios equal) ?


$$
\frac{5}{3}=\frac{15}{9}
$$

$$
\frac{9}{12}=\frac{26}{36}
$$



Find the missing value ( $x$ )


The ratio of gas to oil is $50: 1$. If I add 3 oz of oil, How many oz of gas is needed to meet the ratio? gas oil


When spraying for weeds, the weed killer uses a ratio of 12 oz of weed killer to 4 gallons of water.

I put 18 oz of weed killer in my sprayer, how much water do I need to add?


The ratio of "saves to goals" in hockey is 50 saves for every 5 goals. If eight goals are scored, how many saves is that?




Unit Rate (Divide to get it):

$150 \div 2=75$ heartbeats per minute | Unit |
| :--- |
| Rate: |

A unit rates have a denominator of 1 unit

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## Unit 5 Notes



## Fractions, Decimals \& Percents

## 5-5

- I can write a percent as a fraction and decimal.
- I can write a decimal as a fraction and percent.
- I can write a fraction as a decimal and percent.


## Three looks, same value.




## Unit 5 Notes



## Percents

## Fractions

-Put the percent over 100 \& drop \% sign.
-Reduce if needed.

$$
25 \% \rightarrow \frac{25}{100+55} \frac{1}{4}
$$

## Percents of Numbers



- I can find the percent of a number using proportions \& decimals.
- I can use proportions to find the whole when given the part \& percent.
- Find percent to solve real-life problems (sales tax, sale price, tipping...)


\section*{| Page 5 |
| :---: |
| $5-5$ Stes |
| Solving Percent Questions |}

With Percents, the word "of " means to multiply.
When solving equations, write a proportion.


Finding the Percent of the Whole


Finding the Percent of the Whole
15 girls are on the CMS volleyball team.
$20 \%$ of the girls also play on a travel team.
How many of the girls on the middle school team also play on a travel team?


Finding the Whole, given the \% or Part 28 is $40 \%$ of what number?
(same question worded differently) $40 \%$ of what number is 28 ?


## Steps to Solving Percent Story Problems

1. Determine what you are solving: $\frac{\text { the whole }}{\text { bottow }}$, the pogart, or the percent.
2. Set up your proportion.
3. Solve for the missing value in your proportion.


Finding the Whole, given the \% or Part
The CMS Volleyball team won $85 \%$ of its game this season. In total, they won 17 games.

How many games did they play?


Finding the \% of a Number
5 is what percent of 25?
(same question worded differently)
What percent of 25 is 5 ?


Finding the \% of a Number
The Coopersville Middle School Volleyball team lost 12 of its 30 games.

What is the percentage of games they lost?


This problem to the end is your homework due tomorrow.

## Types of Percent Story Problems

- The sale price of items,
such as $20 \%$ off $\$ 50$.
- The tip on a dinner bill,
the $30 \%$ tip on a $\$ 50$ food bill.
- The sales tax of an item,
such as $6 \%$ sales tax rate.



## Percent Story Problems

Sally and her family went out to dinner last night. Their dinner bill with tax came to $\$ 50.00$ The service was excellent, so her family decided to leave a $20 \%$ tip.

What will the total bill be?



## Percent Story Problems

Best Buy has a 70" TV on sale for $10 \%$ off the current price. The current price is $\$ 1000.00$.
What will be the price you pay after the discount?


What is the final price with the $6 \% \mathrm{MI}$ Sales tax?


