Lesson 1: Ratios

In Lesson 1, we learned about ratios.

First we learned about ratio relationships. Examples of ratio relationships are "For every 6 boys there are 5 girls," or "for every 1 mile I run, I complete four laps around the track".

A ratio is a comparison between two quantities written as A:B or A to B. You can write ratio relationships as ratios by taking the relationships above and writing them as "6 to 5" or "1:4".

Ratios can be represented in ratio tables. For example, the ratio relationship "For every 6 boys there are 5 girls" can be written as a ratio in a table like this:

BOYS	GIRLS
6	5

The table can be expanded to find more ratios.

BOYS	GIRLS
6	5
12	10
18	15

Ratios can also be represented in tape diagrams.

BOYS ☐☐☐☐☐☐

GIRLS ☐☐☐☐☐

Learning Targets

By the end of this lesson, you will be able to answer the following questions:

(1) What is a ratio?

(2) What is a ratio relationship?

(3) How can you represent ratios with tape diagrams?

Learning Targets

Why do you need to know this?
Ratios can be used to solve all types of real world problems. We use ratios to decide what items have the best price when we shop, which cars get the best gas mileage, and many other real world problems.
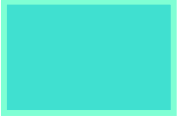
Classwork

Example 1

The coed soccer team has four times as many boys on it as it has girls. We say the ratio of the number of boys to the number of girls on the team is $4:1$. We read this as "four to one."

Let's create a table to show how many boys and how many girls are on the team.

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# of boys	# of girls	total # of players

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# of boys	# of girls	total # of players

Is this big enough for a team?

# of boys	# of girls	total # of players
4	1	5

What are some other options that show four times as many boys as girls or a ratio of boys to girls of 4:1?

Suppose the ratio of number of boys to number of girls on the team is 3 : 2.

Create a table like the other one to show different options for players on the team?

# of boys	# of girls	total # of players

Suppose the ratio of number of boys to number of girls on the team is $3:2$.

# of boys	# of girls	total # of players
3	2	5
6	4	10
9	6	15

I can't say there are 3 times as many boys as girls. What would my multiplicative value have to be?

There are __3/2__ as many boys as girls?

Suppose the ratio of number of boys to number of girls on the team is $3:2$.

Can you visualize 3/2 as many girls as boys?

Talk in your groups about how you visualize this.

Suppose the ratio of number of boys to number of girls on the team is $3:2$.

We can make a tape diagram (or bar model) that shows there are 3/2 as many boys as girls.

Boys

Girls

There are 3 boys for every 2 girls.

Suppose the ratio of number of boys to number of girls on the team is $3:2.$

Which description makes the relationship easier to visualize:

saying the ratio is 3 to 2 ✓

or

saying there are 3 halves as many boys as girls?

What is the ratio of boys to girls in our class?

Figure out the answer yourself, then talk to your group to see if you all agree.

How can we say this answer as a multiplicative comparison without using ratios?

Example 2: Class Ratios

Record a ratio for each of the examples the teacher provides.

Write the ratio of the number of boys in the class to the number of girls in the class in your notes under Example 2 Question 1.

Compare your answer with your neighbors.
Does everyone's answer look the same?

Record a ratio for each of the examples the teacher provides.

It is okay to use either the colon symbol or the word "to" between the two numbers of the ratio.

The ratio does not have words attached to it. When you describe a ratio with the word, this is called a ratio relationship.

Record a ratio for each of the examples the teacher provides.

What is the ratio of the number of girls in the class to the number of boys?

Write the ratio in your packet under Example 2 Question 2.

Record a ratio for each of the examples the teacher provides.

Is the ratio of the number of girls in the class to the number of boys in the class the same as the ratio of the number of boys in the class to the number of girls?

Record a ratio for each of the examples the teacher provides.

What is the multiplicative comparison for the number of girls in the class to the number of boys?

The number of girls is the class is _____ the number of boys in the class.

Record a ratio for each of the examples the teacher provides.

What is the multiplicative comparison for the number of girls in the class to the number of boys?

The number of girls is the class is _____ the number of boys in the class.

Record a ratio for each of the examples the teacher provides.

Let's record a ratio for each of the following examples in your notes packet.

3. The ratio of the number of people who traveled out of state this summer and the number of people who did not travel out of state.

Record a ratio for each of the examples the teacher provides.

Let's record a ratio for each of the following examples in your notes packet.

4. The ratio of the number of people who did NOT travel out of state this summer and the number of people who DID travel out of state.

Record a ratio for each of the examples the teacher provides.

Let's record a ratio for each of the following examples in your notes packet.

5. The ratio of the number of people who have AT LEAST one sibling to the number of people who are ONLY children.

Record a ratio for each of the examples the teacher provides.

Let's record a ratio for each of the following examples in your notes packet.

6. The ratio of the number of people whose favorite class IS math and the number of people whose favorite class IS NOT math.

Exercise 1

PARTNER WORK: Look around the classroom and think your own ratio using something you can see in the classroom. With your partner, write a ratio statement that represents your ratio and then write your ratio in numbers.

My own ratio compares _____

to _____

My ratio: _____

Exercise 2

PARTNER WORK: Write ratio relationships in words that could be represented by the given ratio. Make sure you take into account the ORDER MATTERS.

Examples:

1 to 12 _____ *1 to 12 - For every 1 foot there are 12 inches.*

_____

12:1 _____ *12:1 - For every 12 inches there is 1 foot.*

_____

2 to 5 _____ *2 to 5 - For every 2 weekend days there are five weekdays.*

_____

5 to 2 _____ *5 to 2 - For every five students there are two cookies.*

_____

10: 2 _____ *10:2 - For every ten months that don't start with the letter "M" there are two months that do start with the letter "M".*

_____

2: 10 _____ *2:10 - For every two months of summer there are ten months of school.*

_____

CLOSING

Answer the Essential Questions in your math journal.

(1) What is a ratio?
A ratio is a comparison between two quantities, like 12:1.

(2) What is a ratio relationship?
A ratio relationship is a comparison of two quantities in a context, like "for every twelve inches there is one foot".

(3) How can you represent ratios with tape diagrams?

A ratio can be represented in a tape diagram by drawing the number of boxes for the first ratio quantity on top and the number of boxes for the second ratio quantity on the bottom.

Exit Ticket

1. Write a ratio for the following description: Kaleel made three times as many baskets as John during basketball practice.

2. Describe a situation that could be modeled with the ratio 4: 1.

3. Write a ratio for the following description: For every 6 cups of flour in a bread recipe, there are 2 cups of milk.

Homework

Problem Set Lesson 1