

Ratios and Measurement Conversion

Objectives

You will be able to

- Represent ratios in a variety of ways (words, fraction, double number line, tape diagram, etc.).
- Demonstrate whether or not ratios are equivalent.
- Use ratios to convert units of measurement.
- Collaborate with peers.



How can ratios help us create maps and tours of our communities?

Evaluation and Feedback

To evaluate your work, you will

• Complete a check for understanding about equivalent ratios.

Learning Task 2: Ratios and Measurement Conversion

As a group:

- Choose three important places near your tour location and determine the distance between the places in feet and miles.
- Convert measurements from miles to feet and feet to meters.

Vocabulary

- conversion
- double number line
- equivalent ratios
- feet
- measurement
- meters
- miles
- table
- tape diagram

Connect to the Culminating Project

• Convert distances between important places near your tour location from miles to feet.



Ways of Representing Ratios Reference Sheet

Situation: A juice recipe calls for 5 cups of grape juice for every 2 cups of peach juice. How many cups of grape juice are needed for a mixture that uses 8 cups of peach juice?

Words

Say: 5 cups of grape juice to 2 cups of peach juice5 cups of grape juice for every 2 cups of peach juice

Picture

Use Ratio Reasoning: (Note that in the picture, represents 1 cup of grape juice and represents 1 cup of peach juice.) For every 2 cups of peach juice there are 5 cups of grape juice, so you can draw groups of the mixture to figure out how much grape juice you would need.



You can see that when you have $4 \times 2 = 8$ cups of peach juice, you need $4 \times 5 = 20$ cups of grape juice.

Table

This table shows that every time you add 2 more cups of peach juice, you need to add 5 cups of grape juice. So, you need 20 cups of grape juice for 8 cups of peach juice.

	Cups of Grape Juice	Cups of Peach Juice	
C	5	2	7
+5 🖌	10	4	+2
	15	6	
	20	8	
	25	10	



Tape Diagrams

Beginning method: In this tape diagram, the pieces in one strip of tape each represent 1 cup of liquid. You can copy one strip until you have 8 cups of peach juice. Then you can see that you need 20 cups of grape juice for 8 cups of peach juice.



Advanced Method: You can create a tape diagram in a ratio of 5 : 2. Since you know that there should be 8 cups of peach juice, you make each piece of tape worth 4 cups. That means there are $5 \times 4 = 20$ cups of grape juice.



Double Number Line

You can set up a double number line with cups of grape juice on the top and cups of peach juice on the bottom. When you count up to 8 cups of peach juice, you can see that you get to 20 cups of grape juice.





LESSON 1

RATIOS

WARM-UP

Multiplication and Division

6 × 4 =

4 × 6 =

24 ÷ 6 =

24 ÷ 4 =

Show how you know:

- How many times bigger is 24 than 6?
- How many times bigger is 24 than 4?
- How many times bigger is 30 than 10?
- How many times bigger is 75 than 15?
- How many times bigger is 14 than 8?



PROJECT ACTIVITY

Getting from Place to Place

This is an example of a map from <u>Google Maps</u>. You will use <u>Google Maps</u> to find distances in your tour.



Choose three of the important places that you chose in the previous Learning Task to answer the questions below.

Place A	Place B	Place C

 Complete the table below. First, convert miles to feet (you can use the "measure distance" tool in <u>Google</u> <u>Maps</u> to do this). Then use Google Maps to find the distances between Places A, B, and C in feet and miles.

Miles	Feet
1	5,280
2	10,560
4	
10	
12.5	



Miles	Feet
(distance from Place A to Place B)	
(distance from Place B to Place C)	
(distance from Place C to Place A)	

2. What connection(s) or patterns do you notice in the table?

3. How can you figure out how many feet are in *any* number of miles?



4. Some tours provide distances using the metric system. Complete the table below. Use the distances in feet that you found in question 1.

Feet	Meters
1	
2	
4	
10	
12.5	
(distance from Place A to Place B)	
(distance from Place B to Place C)	
(distance from Place C to Place A)	

5. Create a double number line to show the ratio connection between feet and meters.



6. Represent the ratio connection between feet and meters using a different method (for example, a picture, coordinate plane, words, or something else).

7. Which way(s) of representing the ratio connection between feet and miles did you find most useful? Why? Is this representation also the most useful for comparing feet and meters? Why or why not?



LESSON 2

MEASUREMENT CONVERSION

WARM-UP

Ratios

The ratio of cats to dogs in Mr. Malamut's house is 3 : 1.

Answer the following questions. Show how you know.

- 1. If Mr. Malamut has 9 cats, how many dogs does he have?
- 2. If Mr. Malamut has 9 dogs, how many cats does he have?

3. If Mr. Malamut has 40 pets, how many cats does he have?

PROJECT ACTIVITY

Getting from Place to Place

Continue working on the Getting from Place to Place activity from Learning Task 2, Lesson 1.



CHECK FOR UNDERSTANDING

Test your knowledge of equivalent ratios using the Check for Understanding • Equivalent Ratios.