Objective   Using Tables to Represent Ratios

Warm-Up

It takes 1 cup of milk to make a batch of 8 pancakes.

1. How many cups of milk does it take to make 16 pancakes?

2. How many pancakes can be made with 4 cups of milk?

I'm Your Density

Population density is a ratio that compares people to square miles.
The graph shown gives the approximate population density of four U.S. states in 2015.

1. Which of the states shown has the greatest population density?
Which state has the least population density? Explain what this means in your own words.

Key:

👤 = 200 people

☐ = 1 square mile

Oregon

North Carolina

New Jersey

Texas
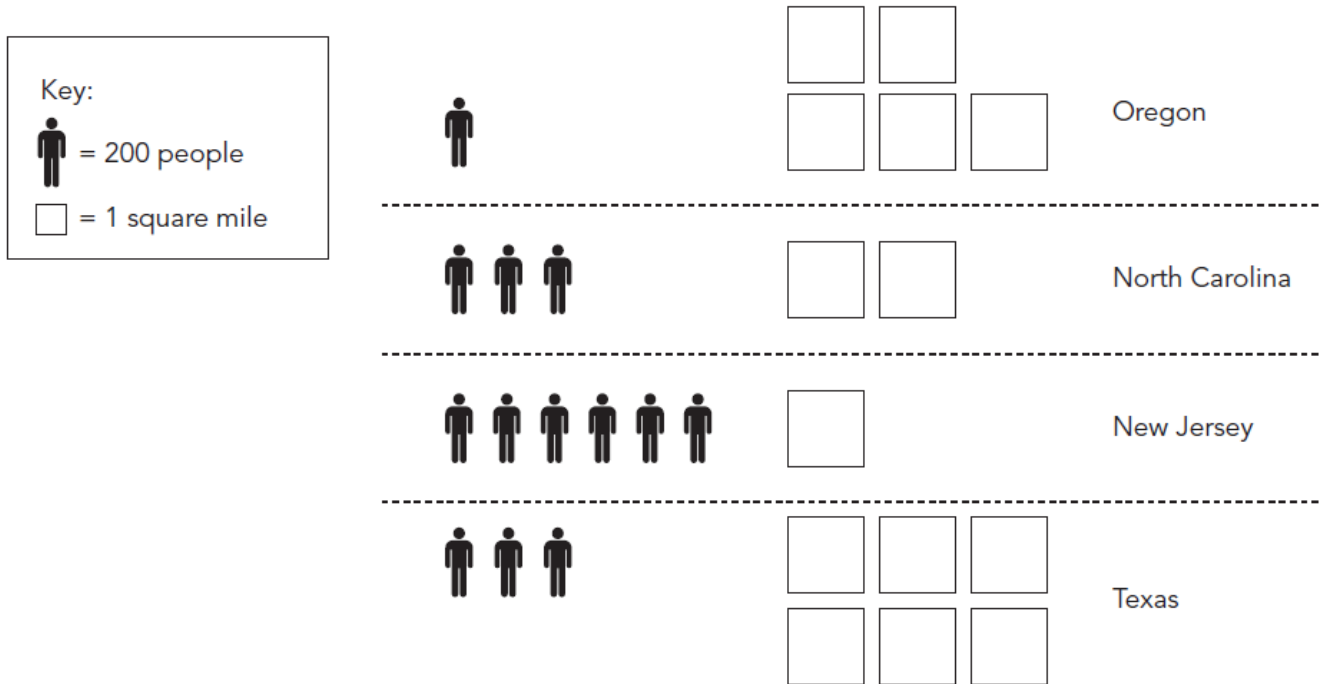
2. What is the population density of your state or your city?
How does this compare with other states or cities?

Gravity is a natural force that attracts objects to each other. Gravity is the pull toward the center of an object like the Earth, a planet, or the Moon. Your weight on the Earth is the measure of the amount of gravitational attraction exerted on you by the Earth. The Moon has a weaker gravitational force than the Earth.

The ratio of weight on Earth : weight on the Moon is approximately 60 lb : 10 lb.

You can use ratio tables to show how two quantities are related.
Ratio tables are another way to organize information.

WORKED EXAMPLE

The table represents three equivalent ratios of weight on Earth (lb) : weight on the Moon (lb).
The ratio of 60 lb on Earth : 10 lb on the Moon is given.

add

÷2

Weight on Earth (lb)	60	30	90
Weight on the Moon (lb)	10	5	15

÷2

add

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1. Verify that adding the two existing equivalent ratios 60 lb on Earth : 10 lb on the Moon and 30 lb on Earth : 5 lb on the Moon produces the equivalent ratio 90 lb on Earth : 15 lb on the Moon by analyzing the quotient of each ratio. What do you notice?

2. Can you show a different strategy to determine the ratio of 90 lb on Earth : 15 lb on the Moon?

3. Howard, Carla, Mitsu, and Ralph each determined the weight of a 120-lb person on the Moon.
a. Compare Howard's and Carla's strategies.

Howard 👍
I can scale 60 up to 120 by multiplying by 2, so then I must also multiply 10 by 2 to get 20.

×2

Weight on Earth (lb)	60	30	90	120
Weight on the Moon (lb)	10	5	15	20

×2

Carla 👍
I also got the ratio of 120 lb on Earth : 20 lb on the Moon.

×4 (30 lb on Earth : 5 lb on the Moon
120 lb on Earth : 20 lb on the Moon) ×4

b. Explain Mitsu's reasoning. Then verify the ratio 120 lb on Earth : 20 lb on the Moon is a correct equivalent ratio.

Mitsu 👍

I used the weights for a 30-lb person and a 90-lb person to obtain the weight of a 120-lb person.

Weight on Earth (lb)	60	30	90	120
Weight on the Moon (lb)	10	5	15	20

So that means 120 lb on Earth : 20 lb on the Moon.

c. Explain why Ralph's reasoning is not correct.

Ralph 👎

The difference between 90 and 120 is 30, so I just added 30 to 15 and got 45.

+30

Weight on Earth (lb)	90	120
Weight on the Moon (lb)	15	45

+30

I got the ratio of 120 lb on Earth : 45 lb on the Moon.

4. Mitsu said, "I see another equivalent ratio when I look at the way Carla showed her work."

30 lb on Earth : 5 lb on the Moon
120 lb on Earth : 20 lb on the Moon
150 lb on Earth : 25 lb on the Moon

Is Mitsu correct? Explain her reasoning.

5. Use the table to show a different calculation for the ratio of 150 lb on Earth : 25 lb on the Moon. Explain your reasoning.

Weight on Earth (lb)	60	30	90	120	150
Weight on the Moon (lb)	10	5	15	20	25

The 6th-grade pizza party is planned for tomorrow. Tracy is in charge of ordering the pizza for 450 students. The pizza parlor said two pizzas will serve 9 students. Tracy made a ratio table to help her determine how many pizzas to order for 450 students.

Pizzas	2	10	
Students	9	45	450

1. Explain Tracy's strategy and determine the number of pizzas needed.

2. Complete the table to show the number of pizzas to order given the number of students. Explain your calculations.

Pizzas	2	10						
Students	9	45	450	135	270	225	900	1350

Use your table of values to answer each question.
Explain your calculations.
a. How many students will 12 pizzas feed?

b. How many students will 20 pizzas feed?

c. How many students will 90 pizzas feed?

LESSON 4.4a
A Trip to the Moon

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Review

1. In tennis, an ace is a legal serve that cannot be returned and is not even touched by the opponent's racket. Cecelia has an excellent serve. Last week, Cecelia hit 7 aces in 2 matches.

   a. If she plays 6 matches in the regional tournament, how many aces should she expect? Show your work.

   b. If she plays 10 matches in the regional tournament, how many aces should she expect? Show your work.

2. The winning time for the middle school 4-person 100-meter relay was 62.59 seconds. Suppose that each runner ran exactly the same amount of time. What would the time be for each runner?

3. Spring Hill Park is on a rectangular piece of land that measures 0.75 mile by 1.25 miles. Draw and label a rectangle to represent the park. Then determine the area of the park.

4. Determine each product.

   a. 25×0.31

   b. 7.05×3.72