UNIT 1

Number Sense

Level H

Mc Graw Hill Education

Lesson 1

Find the Math

Joshua loves to play baseball. He keeps careful records of his games, counting the number of times he is at bat in each game, how many times he hits the ball, and how many times he is out.

PHOTO: RBFried/E+/Getty Images

1. In one game, Joshua has 6 chances at bat. He makes 4 base hits. What is the ratio of hits to times at bat?

2. In the same game, one of Joshua's hits is a home run! What is the ratio of home runs to hits?

3. Joshua is the pitcher for his team. During one week this season, he pitched 12 innings out of 27 innings played by his team. What is the ratio of innings Joshua pitched to total innings played by the team? Write this ratio in simplest form.

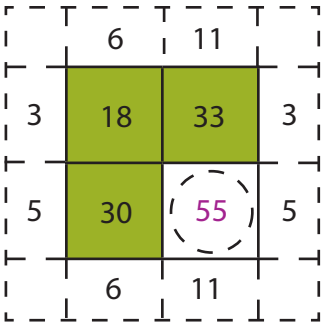
Lesson 1

Key Idea

A proportion table is a tool to help calculate a missing amount in a ratio.

$\frac{18}{30} = \frac{33}{?}$

$55 = ?$



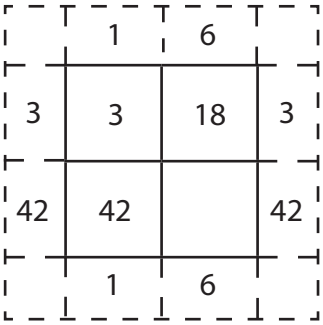
Try This

Use proportion tables to help you solve the problems.

1. If 3 *Rap the Rock* T-shirts sell for $42, and you need to get enough of them for all 18 people in the fan club, how much will they cost?

$\frac{3}{42} = \frac{18}{?}$

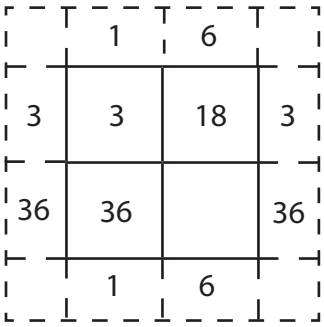
_____



2. How much if the cost for 3 shirts decreases to $36?

$\frac{3}{36} = \frac{18}{?}$

_____

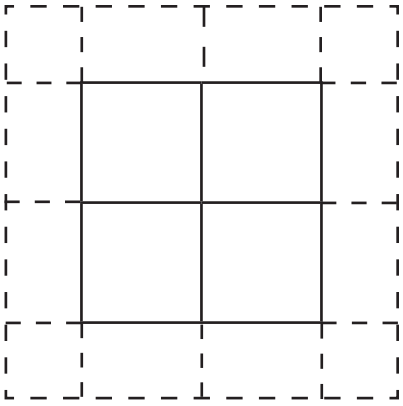


Practice

Use proportion tables to help you solve the following problems.

3. If your dog eats 50 pounds of dry food in 15 days, how long will it take it to eat 80 pounds of food?

_____

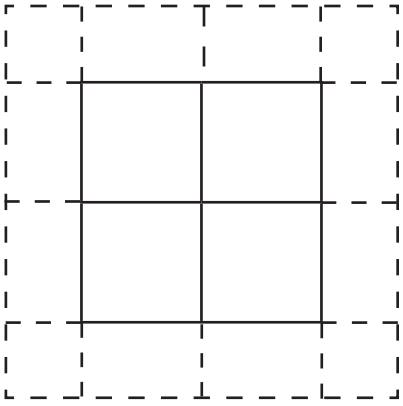


4. How long to eat 110 pounds?

_____

5. If your school makes 72 cents profit on every 6 raffle tickets sold, how much will it make when it sells the 11th ticket?

_____



6. When it sells the 18th ticket?

_____

Reflect

Your cat ate 5 cans of cat food. If you want to determine how much she eats in one day, what information do you need?

_____

_____

Lesson 2

Key Idea

Use proportions to find equal rates that show the relationship between two different kinds of quantities.

You can earn $12 per hour mowing lawns.
The ratio is dollars to hours.
How much can you earn if you mow for $3\frac{1}{2}$ hours?

Solve for the missing factor in proportions with equivalent fractions, algebra and cross products, or proportion tables.

Equivalent Fraction	Algebra/Cross Products	Proportion Table
$\frac{12}{?} = \frac{60}{210}$ $\frac{12}{?} = \frac{60}{210}$ $\frac{12 \times 5}{42 \times 5} = \frac{60}{210}$	$\frac{12}{?} = \frac{60}{210}$ $12 \times 210 = ? \times 60$ $2{,}520 = ? \times 60$ $2{,}520 \div 60 = ?$ $42 = ?$	$ EARNED TIME 1 5 12 12 60 12 210 1 5

Try This

Use this chart to help solve the problems.

	Girls	Boys	Faculty
Buy a hot lunch	32	28	4

1. What is the ratio of all the people who buy a hot lunch to the faculty who buy a hot lunch?

_____

2. Write another ratio that is equal to that amount.

_____

Practice

Complete the ratios of hits to the items at bat for each player, and write their ratios in the right-hand column.

Player:	Hits:	Times at Bat:	Ratio:
Martinez	15	20	
Antonio	15	35	
Smithy	12	32	

3. Which player hits the ball more often than the other two when at bat?

_____

4. What is the ratio in simplest terms comparing the number of times at bat Martinez has to Smithy?

_____

Draw and label a proportion table to solve this problem.

5. If your parents say you may watch television for 2 hours per day, how many days will it take you to watch 56 hours of TV programs?

_____

Reflect

In social studies, 18 out of 30 students passed at the 85% or above level. Someone said that the ratio of students getting that grade compares to a rate of 4:5. Explain why this answer is incorrect.

_____

_____

_____

Lesson 3

Key Idea

A **rate** is a ratio that is used to compare different kinds of measure.

Constant speed is an example of a rate that is used to solve real-world problems.

A family on vacation travels 520 miles over 8 hours in one day.
Find their speed.

Write a ratio of distance to time.

$$\frac{\text{Distance}}{\text{Time}}$$

$$\frac{520 \text{ miles}}{8 \text{ hours}}$$

Write the ratio in simplest form.

$$\frac{65 \text{ miles}}{1 \text{ hour}}$$

You can also use the algorithm *outcome* = *rate* × *time* to solve rate problems.

Try This

Solve each problem using constant speed.

A passenger train travels 528 in 8 hours.

1. What is the unit rate of speed for the train?

_____

2. How far will the train travel in 5 hours at this rate?

_____

3. How long would it take the train to travel 726 miles?

_____

Calculate the unit rate to solve each problem. Show your work.

4. Isaiah saves $75 of his earnings each month for college. How much money will Isaiah save in one year?

_____

5. A runner in the park can run 2 miles in 20 minutes. How far can he run in $1\frac{1}{2}$ hours? (hint: There are 60 minutes in one hour).

_____

6. A department store employee can wrap 60 packages in 3 hours. How many packages can she wrap in one eight-hour workday?

_____

7. Patrick measured that it rained 1 inch in 4 hours. At this rate, how much will it rain in 15 hours?

_____

Reflect

Why is it important that speed is constant when using *outcome* = *rate* × *time*?

_____

_____

Lesson 4

Key Idea

Calculating the unit price of items allows you to compare values.

You would expect the larger box to have a greater price.

Divide the price by the amount of cereal in the box to find the price per ounce.

15 ounces
$4.20
Unit Price: $0.28/ounce

18 ounces
$4.86
Unit Price $0.27/ounce

The cereal box on the right has a lower unit price. It has a better value.

Try This

Find the unit price to answer the questions below.

You want to buy 3 boxes of instant oatmeal. You can buy 3 boxes for $2.12 each or a package of 3 boxes for $6.75.

1. What is the unit price for the package of 3 boxes?

_____

2. Which buy represents the better value?

_____

3. At what price would the package of 3 boxes become the better value?

_____

Practice

Find the unit price for each item.

4. A 10-slice pizza costs $15.00.

Unit price: _____ per slice

5. A 9-ounce box of crackers costs $5.58.

Unit price: _____ per ounce

6. One dozen eggs costs $3.12.

Unit price: _____ per egg

7. A box of 8 markers costs $1.92.

Unit price: _____ per marker

Reflect

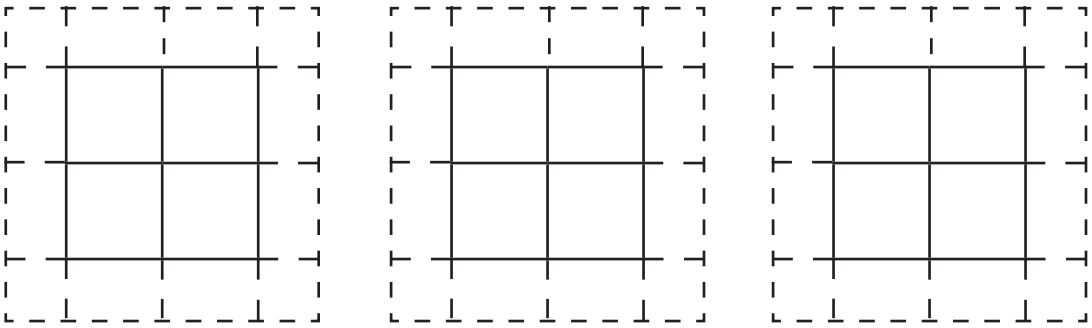
You want to buy 45 trading cards. Should you buy packs of 15 cards for $4.95 or a bonus pack of 45 cards for $13.95? Explain your reasoning.

Lesson 5 Review

This week you learned how to use ratios and rates to solve real-world problems.

Lesson 1

Use a proportion table to help you solve the following problems.



1. If one can of tennis balls on sale costs $4, how many cans can be purchased for a tournament with a budget of $64? _____

2. With a tournament budget of $95? _____

3. In Problem 2, how much money is left over? _____

Lesson 2

Use this chart to help solve the problems.

	Children Under 12	Teenagers	Adults
Watch cartoons	45	27	15
Do not watch cartoons	3	26	15

4. What is the ratio of teens who watch cartoons to the total number of teens?

_____

5. What is the ratio of adults surveyed to children under 12 surveyed?

_____

6. Who has the highest ratio of watching cartoons out of the three groups?

_____

Lesson 3

Find the constant rate of speed to answer each question.

7. Julio can ride one mile on his bicycle in 6 minutes. What is Julio's speed in miles per hour? (hint: There are 60 minutes in one hour)

_____

8. Casey can eat 5 hamburgers in 20 minutes. How fast can Casey eat 1 hamburger?

_____

9. A car is traveling at a constant speed of 45 miles per hour. How far will the car travel in 5 minutes? (hint: There are 60 minutes in one hour)

_____

Lesson 4

Find the unit price for each item. Round your answers to the nearest cent.

10. A package of 12 pencils costs $2.88.

_____

11. A package of 6 pairs of socks costs $6.96.

_____

12. A package of 800 plastic-coated paper clips costs $8.00.

_____

Reflect

Why is it important to calculate unit rates and unit prices when solving real-world problems?

_____

_____

_____

Project-Based Learning

Project
A League of Your Own

List the players you have recruited in your league using the information from Week 2. Set the salary for each player, and then calculate the unit price per game. You may use the information your teacher supplies as a guideline, but remember that you are the commissioner. You have $4,000,000 to spend on these six players—pay attention to your budget!

How many games does each team play in your regular season schedule?

_____

Player	Team	Annual Salary	Unit Price (Salary per Game)

Reflect

How might a reporter explain that an athlete who earns $800,000 per year earns less than an athlete who earns $600,000 per year?

_____

_____

_____

_____

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