

Classroom Mathematics

California

Teacher Toolbox

Resource Sampler



GRADE

6

by  i-Ready

Engaging Resources to Drive Student Growth

The Teacher Toolbox for *Classroom Mathematics California* is an important part of your digital experience and companion to your Teacher's Guide, as it houses many of the resources you need to deliver effective core mathematics instruction. You'll see references to specific Teacher Toolbox resources throughout the Teacher's Guide, pointing you to materials you can use for whole class instruction and small group differentiation. The Teacher Toolbox resources are accessible through the Teacher Digital Experience via i-ReadyConnect.com.

Easily Access All Grades K–8 Resources on the Teacher Toolbox:

- Activity Sheets 
- Assessments (Lesson Quizzes, Assessment Notes Recording Sheet, and Unit Assessments—Forms A and B) 
- Centers Library 
- Cumulative Practice 
- Digital Math Tools Powered by Desmos
- Graphic Organizers 
- Games (Unit Level for Grades K–8 and Grade Level for Grades K–2) 
- Enrichment Activities 
- Family Letters 
- Fluency and Skills Practice 
- Implementation Support
- Interactive Tutorials 
- Literacy Connection Activities 
- Learning Activities (On Level, Below Level, and Above Level) 
- Student Worktext PDFs 
- PowerPoint® Slides 
- Teacher's Guide PDFs 
- Tools for Instruction 
- Unit Flow & Progression Videos (closed captioned in English and Spanish)

 = Available in English and Spanish

Microsoft PowerPoint® is a registered trademark of Microsoft Corporation.

Grade 4 Teacher Toolbox Shown

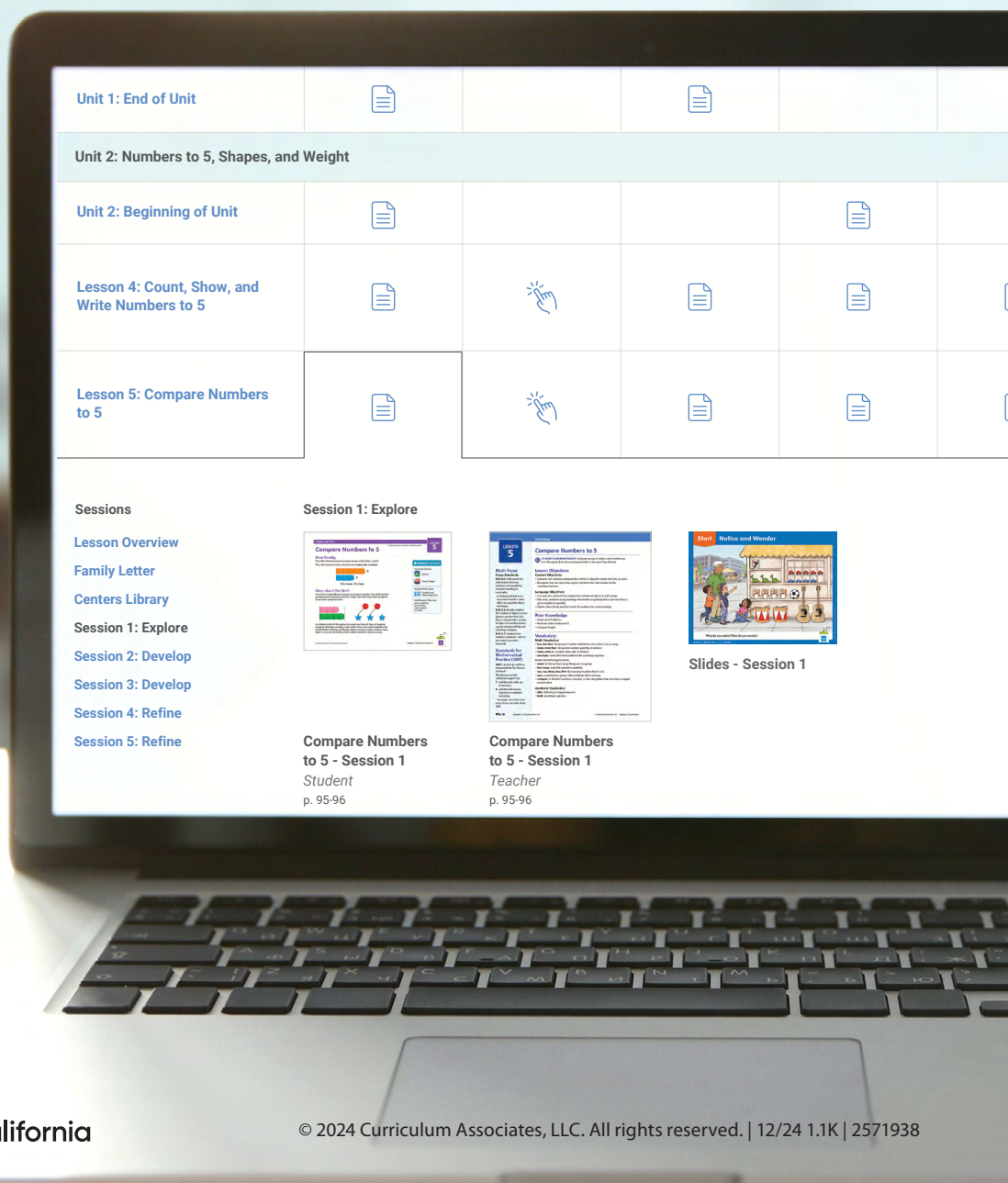


Table of Contents

This sampler includes some of the lesson- and unit-level resources available on Teacher Toolbox for

**Unit 4: Ratio Reasoning:
Unit Rates and Percent,
Lesson 16: Use Unit Rates
to Solve Problems.**

Program
Implementation
Page 4

Lesson-Level
Resources
Page 6

Unit-Level
Resources
Page 23

**Check out the Teacher
Digital Experience
Walkthrough to see
more digital resources!**

Explore all Grades K–8 resources in your demo account. Review the Teacher Digital Experience Walkthrough to see how.



Program Implementation Support

A wealth of resources to help California educators implement *Classroom Mathematics California* as a core program, including digital versions of support found in your Teacher's Guide, plus Try–Discuss–Connect instructional framework details, pacing and correlations resources, Digital Math Tools powered by Desmos, Data Talk Displays, and more

Program

Classroom California ...

Subject

Math

Grade

K

1

2

3

4

5

6

7

8

Classroom Resources

Classroom Resources (Spanish)

Assessment Practice

Program Implementation

Whole Class Instruction			Small Group Differentiation			
Teach		Assess	Prepare	Reteach	Reinforce	Extend
Instruction & Practice	Interactive Tutorials	Lesson Quizzes & Unit Assessments	Prerequisite Lessons	Tools for Instruction	Math Center Activities	Enrichment Activities

Unit 1: Whole Numbers: Place Value, Comparison, Addition, and Subtraction

Teaching and Learning Resources

• Digital Math Tools Powered by Desmos and Supporting Videos

• **Discourse Cards and Discourse Cube** ^{E/S}

• Activity Sheet Resources ^{E/S}

• **Data Sets** ^{E/S}

• Graphic Organizer Resources ^{E/S}



Discourse Card Example Shown

Data Sets			
Points Scored			
Lesson 10 Unit 7 Session 2			
Points Scored		Points Scored	
Date	Points	Date	Points
Oct 10	85	Oct 10	120
Oct 11	88	Oct 11	115
Oct 12	85	Oct 12	120
Oct 13	90	Oct 13	118
Oct 14	87	Oct 14	122
Oct 15	124	Oct 15	120
Oct 16	122	Oct 16	121
Nov 1	100	Nov 1	119
Nov 2	100	Nov 2	120
Nov 3	100	Nov 3	120
Nov 4	100	Nov 4	120
Nov 5	100	Nov 5	121
Nov 6	100	Nov 6	120
Nov 7	100	Nov 7	121
Nov 8	100	Nov 8	121
Nov 9	100	Nov 9	121
Nov 10	100	Nov 10	121
Nov 11	100	Nov 11	121
Nov 12	100	Nov 12	121
Nov 13	100	Nov 13	121
Nov 14	100	Nov 14	121
Nov 15	100	Nov 15	121
Nov 16	100	Nov 16	121
Nov 17	100	Nov 17	121
Nov 18	100	Nov 18	121
Nov 19	100	Nov 19	121
Nov 20	100	Nov 20	121
Nov 21	100	Nov 21	121
Nov 22	100	Nov 22	121
Nov 23	100	Nov 23	121
Nov 24	100	Nov 24	121
Nov 25	100	Nov 25	121
Nov 26	100	Nov 26	121
Nov 27	100	Nov 27	121
Nov 28	100	Nov 28	121
Nov 29	100	Nov 29	121
Nov 30	100	Nov 30	121
Dec 1	100	Dec 1	121
Dec 2	100	Dec 2	121
Dec 3	100	Dec 3	121
Dec 4	100	Dec 4	121
Dec 5	100	Dec 5	121
Dec 6	100	Dec 6	121
Dec 7	100	Dec 7	121
Dec 8	100	Dec 8	121
Dec 9	100	Dec 9	121
Dec 10	100	Dec 10	121
Dec 11	100	Dec 11	121
Dec 12	100	Dec 12	121
Dec 13	100	Dec 13	121
Dec 14	100	Dec 14	121
Dec 15	100	Dec 15	121

Grade 6 Data Sets Example Shown

^{E/S} = Available in English and Spanish

Implementation Support

- UDL Process Toolkit
- Integrating Prerequisites into Grade-Level Instruction
- Student Handbook E/S
- Multilingual Glossary
- Bilingual Glossary
- Spanish Glossary
- Academic Vocabulary Glossary E/S
- Data Science Resources
- Manipulative Lists
- Digital Resource Correlations
- Comprehension Check Correlations
- Spiral Review and Cumulative Practice Correlations
- Try–Discuss–Connect Framework Resources E/S
- Positive Learning Habits

UDL PROCESS TOOLKIT FOR CLASSROOM MATHEMATICS CALIFORNIA

UDL PROCESS PLANNER • GRADE 7 EXAMPLE

UDL Process Planner

Grade 7 Example

Math focus:

Identify the constant of proportionality from a description of a proportional relationship. Use proportional reasoning to solve ratio problems.

Instructional component and its purpose:

The Exit Ticket asks students to write and show how to solve a word problem involving a multi-step proportional relationship and share what they know. It lets the teacher identify and address a common error: writing the reciprocal for the constant of proportionality.

Students' strengths, experiences, and needs related to the math focus:

Strengths:

- SMP 4 – Students have previous experience modeling the constant of proportionality from word problems, diagrams, and xy tables.
- Students have real-world experiences they can use to create the context of their word problem.

Experiences:

- Students use proportional relationships in real life (e.g., doubling a recipe, budgeting for shopping).

Needs:

- Students may forget the second step in their answer.
- Need conceptual, not procedural, understanding of what a proportional relationship is.

1–3 Potential barriers to Engagement, Representation, Action & Expression:

- Students' responses are expected to be written, in English, and in complete sentences, with minimal time. Potential barrier to Expression.
- Students may struggle to quickly generate novel problem context independently. Potential barrier to Engagement and Expression.
- Teacher planning: Unable to see all students' Exit Tickets (i.e., Exit Tickets are in student books, which are taken home).

Relevant supports to leverage:

1–2 Embedded supports:

- Use a Collect and Display chart to capture a variety of models and sentence structures
- Students get to create their own relevant and interesting problem contexts.
- Students can use a graphing calculator to make tables, solve problems, and check work.

1–3 Additional support opportunities:

- Before students start, brainstorm a list of contexts that use proportions.
- Offer choice of response method: type, write in students' home language, draw a picture to model the problem and solution.
- Provide ample time and allow those who do not finish to turn it in the next day. Have children write their Exit Ticket response on a sheet of paper, sticky note, or whiteboard for the teacher to collect.

©Curriculum Associates, LLC Copying permitted for classroom use.

UDL PROCESS TOOLKIT

Page 1 of 1

Grade 7 UDL Process Toolkit Shown

DATA INVESTIGATION | HAVING AN INFLUENCE

UNIT 4

SAMPLE DATA

Sample Data: Survey Results (optional)

Mr. Park's Class Data

Action	YES Responses
Used a reusable bag	15
Turned off water while brushing teeth	16
Put items in a recycling bin	9
Turned off lights when leaving a room	8
Other	13

Number of students surveyed: 25

©Curriculum Associates, LLC Copying permitted for classroom use.

GRADE 6 • UNIT 4

Page 1 of 1

Grade 6 Data Investigation Example Shown



Lesson-Level Resources

Lesson 16: Use Unit Rates to Solve Problems

Additional Practice

Fluency and Skills Practice 7

Differentiation

Reteach: Tools for Instruction 9

Reinforce: Differentiated Learning Activities 11

 On Level. 11

 Below Level. 13

 Above Level 14

Extend: Enrichment Activity. 17

Assessment

Lesson Quiz 19

Support

Family Letter 21

Instructional Presentation Slides. 22



LESSON 16

Using Unit Rates to Find Equivalent Ratios

► Solve each problem. Show your work.

- 1 Rachel mows 5 lawns in 8 hours. At this rate, how many lawns can she mow in 40 hours?

- 2 A contractor charges \$1,200 for 100 square feet of roofing installed. At this rate, how much does it cost to have 1,100 square feet installed?

- 3 It takes Jill 2 hours to run 14.5 miles. At this rate, how far could she run in 3 hours?

- 4 Bobby catches 8 passes in 3 football games. At this rate, how many passes can he catch in 15 games?

- 5 Five boxes of crackers cost \$9. At this rate, how much do 20 boxes of crackers cost?

- 6 It takes a jet 2 hours to fly 1,100 miles. At this rate, how far does the jet fly in 8 hours?



LESSON 16

Using Unit Rates to Find Equivalent Ratios *continued*

- 7 It takes Dan 32 minutes to complete 2 pages of math homework. At this rate, how many pages does he complete in 200 minutes?
- 8 Kendra gets paid \$300 for 5 days of work. At this rate, how much does she get paid for working 24 days?
- 9 Tim installs 50 square feet of flooring in 45 minutes. At this rate, how many square feet of flooring can he install in 405 minutes?
- 10 Taylin buys 5 ounces of tea leaves for \$2.35. At this rate, how much do 12 ounces of tea leaves cost?
- 11 In problem 10, how would your work be different if you were asked how many ounces of tea leaves Taylin could buy with \$10?

Tools for Instruction

Use Ratio Tables to Solve Problems

Objective Use a ratio table and ratio reasoning to convert between units of measure.

Students know that a ratio is a comparison of two quantities that are somehow related. Ratios appear in many contexts, from speed (5 miles in 3 minutes) to recipes (6 cups of flour for 2 cups of water) to costs (5 dollars for 4 avocados) to measurements (3,520 yards to 2 miles). In this activity, students build on ratio knowledge to solve problems.

Some students may follow a process for solving problems involving ratios without understanding why the process works. By taking a given ratio and using ratio tables to “build” the information they need to find, students are able to reason quantitatively, apply their reasoning to solve meaningful problems, and explain their solutions. These skills will be useful later as students solve problems involving such concepts as identifying proportional relationships and solving multi-step percent problems.

Step by Step 15–20 minutes

1 Create a new linear unit.

- Have the student make up a name for an imaginary unit of linear measure (e.g., blips).
- Explain that they will use the imaginary unit to examine relationships among units.

2 Create a conversion ratio.

- Help the student make up a conversion ratio from the new unit of measure to a standard unit of measure.
- For example, suggest that 5 blips is equal to 2 inches.

Support English Learners *Conversión* is a Spanish cognate for *conversion*. Encourage students who speak Spanish to explain the meaning of *conversión* in their own words.

3 Complete a ratio table.

- Demonstrate how to format the table to show equivalent units. Fill in the row for blips as shown below.
- Ask: *Since 5 blips is equivalent to 2 inches, how many inches is 10 blips? How are 10 and 5 related?*
- Help the student fill in more pairs of values. Be sure to include the rate of blips for every 1 inch.

Blips	5	10	20	2.5
Inches	2	4	8	1

4 Model using the table.

- Model how to convert from one unit to the other using the numbers in the table.
- As you point to the table, say: *Since 12 inches is 3 groups of 4 inches, 12 inches is also equal to 3 groups of 10 blips, or 30 blips. What other ways could you use this table to find how many blips equal 12 inches?*

Tools for Instruction

5 Practice converting units.

- Give the student several other measurements to convert from one unit to the other.
- Ask: *How many inches are equal to 50 blips? How many blips are equal to 3 inches? 5 inches?*
- Say: *Explain how to use your table so that another student could make these conversions too.*

Check for Understanding

Present the following problem to the student: Hannah can fold 8 paper airplanes in 6 minutes. How many paper airplanes can Hannah fold in 15 minutes? Encourage the student to make a table to help solve the problem.

For the student who struggles, use the chart below to help pinpoint where extra help may be needed.

If you observe...	the student may...	Then try...
the student has difficulty making basic entries in the table, such as doubling the given ratio	not understand the relationship between equivalent ratios.	asking the student leading questions, such as, "What if you double the number of minutes to get 12 minutes? What happens to the number of planes?"
the student has difficulty finding the rate of paper airplanes for every minute in the table	not understand that the given ratio can also be divided.	drawing a model of the problem and asking how many of the airplane units are equal to one minute and vice versa.
the student has difficulty constructing the number needed from the numbers that are in the table	have difficulty with basic computational fluency.	having the student first identify the relationship among the given numbers in the table, for example, determining if they are multiples or factors of one another.



LESSON 16

Use Ratio and Rate Vocabulary

What You Need

- Recording Sheet

What You Do

- 1 Read the problem on the **Recording Sheet**. Think about how to solve it.
- 2 Read the paragraphs that tell how to solve the problem.
- 3 Use words from the word bank or numbers from the number bank to fill in the blanks. You may use some numbers more than once.
- 4 Take turns filling in the blanks.
- 5 When all the blanks are filled in, read the paragraphs aloud. Do they make sense?
- 6 Fix any mistakes if needed.

KEEP IN MIND . . .

You might change your mind after you fill in some blanks. It's okay to erase!



Check Understanding

Alvin makes pillows for his room. He buys 4.5 feet of fabric for \$9.60. What is the cost of the fabric per yard? Use ratio and rate vocabulary to tell how to solve this problem.



Go Further

Use words from the word bank to describe how to determine the cost of buying 1 yard of each type of fabric that Harper buys.



Use Ratio and Rate Vocabulary

RECORDING SHEET

- Harper is buying fabric to make pillows. At the store, 3 yards of flannel fabric costs \$12.60, and 5 feet of fleece fabric costs \$8.75. Which is the better buy?

I know the units need to be the same to compare the prices.

First, I _____ the length of the flannel fabric to feet.

The _____ of feet to yards is 3 feet : 1 yard.

The _____ is 3 feet per yard. The _____ is 3.

I _____ the number of yards by the unit rate.

The result is _____.

The flannel fabric has a length of _____ feet.

Now, I can find the unit cost of each fabric in _____

per _____.

I _____ to find a(n) _____.

Flannel

Price (\$)	12.60	
Length (ft)		1

Fleece

Price (\$)	8.75	
Length (ft)		1

The flannel fabric costs \$_____ per foot. The fleece fabric costs

\$_____ per foot.

The flannel fabric costs _____ per foot, so it is the better buy.

Word Bank

convert
divide
dollars
equivalent ratio
foot
less
more
multiply
per
rate
ratio
unit rate

Number Bank

1
1.40
1.75
3
5
8.75
9
12.60



CENTER ACTIVITY ●

Names: _____

LESSON 16

Below Level shown here.

Use Ratio and Rate Vocabulary

What You Need

- Recording Sheet

What You Do

- 1 Read the problem on the **Recording Sheet**. Think about how to solve it.
- 2 Read the paragraphs that tell how to solve the problem.
- 3 Use words from the word bank to fill in the blanks. You will use each word only once.
- 4 Take turns filling in the blanks.
- 5 When all the blanks are filled in, read the paragraphs aloud. Do they make sense?
- 6 Fix any mistakes if needed.

KEEP IN MIND . . .

You might change your mind after you fill in some blanks. It's okay to erase!



Check Understanding

A grocery store sells a 5-lb bag of apples for \$7.50. At this rate, how much would a 7-lb bag of apples cost? Use ratio and rate vocabulary to tell how to solve this problem.



Go Further

Use words from the word bank to describe how to determine the cost of buying 1 yard of fleece.



Use Ratio and Rate Vocabulary

RECORDING SHEET

- Harper is buying fabric to make pillows. At the store, 3 yards of flannel fabric costs \$18, and 5 feet of fleece fabric costs \$11. Which is the better buy?

I know the units need to be the same to compare the prices.

First, I _____ the length of the flannel fabric to feet.

The _____ of feet to yards is 3 feet : 1 yard.

The _____ is 3 feet per yard. The _____ is 3.

I _____ the number of yards by the unit rate. The result is 9.

The flannel fabric has a length of 9 feet.

Now, I can find the unit cost of each fabric in _____

per _____.

I _____ to find a(n) _____.

Flannel

Price (\$)	18	2
Length (ft)	9	1

Fleece

Price (\$)	11	2.20
Length (ft)	5	1

The flannel fabric costs \$2 per foot. The fleece fabric costs \$2.20 per foot.

The flannel fabric costs _____ per foot, so it is the better buy.

Word Bank

convert
divide
dollars
equivalent ratio
foot
less
more
multiply
per
rate
ratio
unit rate



CENTER ACTIVITY ●●●

Names: _____

LESSON 16

Above Level shown here.

Use Ratio and Rate Vocabulary

What You Need

- Recording Sheet

What You Do

- 1 Read the problem on the **Recording Sheet**. Think about how to solve it.
- 2 Read the paragraphs that tell how to solve the problem.
- 3 Use words from the word bank or numbers from the number bank to fill in the blanks. You may use some words and numbers more than once.
- 4 Take turns filling in the blanks.
- 5 When all the blanks are filled in, read the paragraphs aloud. Do they make sense?
- 6 Fix any mistakes if needed.

KEEP IN MIND . . .

You might change your mind after you fill in some blanks. It's okay to erase!



Check Understanding

Alvin makes pillows for his room. He buys 4.5 feet of fabric. The fabric costs \$9.60. What is the cost of the fabric per yard? Use ratio and rate vocabulary to tell how to solve this problem.



Go Further

Use words from the word bank to describe how to determine the cost per gallon for each size of orange juice.



Use Ratio and Rate Vocabulary

RECORDING SHEET

- Jasmine is buying orange juice. At the store, there are two different sizes she can buy. Bottle A holds 0.5 gallon and costs \$5.12. Bottle B holds 52 fluid ounces and costs \$3.64. Which is the better buy?

I know the units need to be the same to compare the prices.

First, I _____ the number of gallons Bottle A holds to fluid ounces.

The _____ of fluid ounces to gallons is 128 fluid ounces : 1 gallon.

The _____ is _____ fluid ounces per gallon.

The _____ is 128.

I _____ the number of gallons by the _____.

The result is _____.

Bottle A holds _____ fluid ounces.

Now, I can find the cost of each bottle in _____ per _____.

I _____ to find a(n) _____.

Price (\$)	5.12	
Fluid Ounces		1

Price (\$)	3.64	
Fluid Ounces		1

The 0.5-gallon bottle costs \$_____ per fluid ounce.

The 52-fluid ounce bottle costs \$_____ per fluid ounce.

The 52-fluid ounce bottle costs _____ per fluid ounce,
so it is the better buy.

Word Bank

add
convert
divide
dollars
equivalent ratio
fluid ounce
less
more
multiply
per
rate
ratio
unit rate

Number Bank

0.07
0.08
0.5
0.7
0.8
1.32
10.24
32
52
64
128



ENRICHMENT ACTIVITY

Name: _____

LESSON 16

Spin Doctor

Your Challenge

- **Your company is designing 20 new wind turbines for a wind farm. You need to determine how many blades your turbines should use to get the most energy from each turbine. Here is the information you know so far:**

- Each blade will be 60 meters long.
- The tip of a blade travels 376.8 meters in one revolution.
- The blades can spin at a rate between 12 and 15 revolutions per minute.
- The wind usually blows between 40 and 70 miles per hour.
- There are about 1,609 meters in 1 mile.
- There are 60 minutes in 1 hour.

To select the number of blades, you need to calculate the Tip Speed Ratio (TSR). The TSR is the ratio of the tip speed to the wind speed. You calculate the value of the TSR by dividing the tip speed of the blade by the wind speed.

$$\text{TSR} = \frac{\text{Tip Speed}}{\text{Wind Speed}}$$

The table shows the ideal TSR for turbines with different numbers of blades. The closer you are to the ideal TSR, the more energy you will get from your wind turbine.

Number of Blades	Ideal TSR
2	6.28
3	4.19
4	3.14
6	2.09

To calculate the TSR, the tip speed and the wind speed must be in the same units. For example, they could both be in meters per hour. To find the TSR, you need to find the tip speed. The tip speed is the rate that the tip of the blade travels in one revolution.

$$\text{Tip Speed} = \frac{\text{distance of one revolution}}{\text{time for one revolution}}$$

Use this information to answer the questions on the next page.



ENRICHMENT ACTIVITY

Name:

LESSON 16

Spin Doctor

- 1 Start by finding the time for one revolution. Choose a rate of spin between 12 and 15 revolutions per minute. How many minutes does it take a blade to make one revolution?
- 2 What is the tip speed in meters per minute? What is the tip speed in meters per hour? Show your work.
- 3 Choose a wind speed between 40 and 70 miles per hour. Convert the wind speed to meters per hour. Show your work.
- 4 What is the TSR for your tip speed and wind speed? Round to the nearest hundredth. Show your work.
- 5 How many blades should your turbines use? Explain your reasoning.



LESSON 16 • QUIZ

Name: _____

► Solve the problems.

- 1 Jurgen runs a 26-mile race in 5 hours. Greta runs a 15-mile race in 2 hours. Who runs at a slower rate? Show your work.

SOLUTION _____

- 2 It takes Paresh 4 hours to bike 26 miles. He plans to bike 7 hours tomorrow. If he bikes at the same rate, how far will Paresh bike in 7 hours?

- A** 29 miles **B** 45.5 miles
C 58.5 miles **D** 154 miles

- 3 Karla needs to convert 16 fluid ounces to cups. She knows that 8 fluid ounces = 1 cup. Her work is shown.

The rate is 8 fluid ounces per cup.

Because $16 \times 8 = 128$, the number of cups is 128.

Is Karla correct? Explain your answer.

SOLUTION __________



LESSON 16 • QUIZ

Name: _____

- 4 A researcher is tracking blue whales. One of the blue whales measures 84 feet long. There are 3 feet in 1 yard. How long is the blue whale in yards? Show your work.

- 5 Alejandra spends \$28 for 8 gallons of gas. Decide if each statement about this rate is true or false.

Choose *True* or *False* for each statement.

	True	False
a. Alejandra could buy 9 gallons of gas for \$30.	☐	☐
b. Five gallons of gas would cost Alejandra \$17.50.	☐	☐
c. For \$45, Alejandra could fill an empty 13-gallon tank.	☐	☐
d. The cost of gas is \$3.50 per gallon.	☐	☐



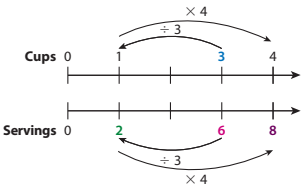
LESSON 16

Dear Family,

This week your student is learning how to solve problems that involve rates. Using **unit rates** can help you find equivalent ratios or compare ratios.

For example, a pastry recipe uses 3 cups of flour for every 6 servings. Suppose you have 4 cups of flour. Dividing 6 by 3 finds the number of servings you can make per cup, or the **unit rate**. Then, multiply the unit rate by 4 to find that you can make 8 servings.

Your student will be learning how to solve problems like the one below.



Learning Games



Match



Pizza



Cupcake

Use Unit Rates to Solve Problems

City A receives 21 inches of snow in 12 hours. City B receives 27 inches of snow in 15 hours. Which city has a heavier snowfall rate?

- ▶ **ONE WAY** to find and compare rates is to use tables of equivalent ratios. Divide to find the **unit rate** for inches of snow in 1 hour for each city.

City A	
Inches	Hours
21	12
1.75	1

City B	
Inches	Hours
27	15
1.8	1

- ▶ **ANOTHER WAY** is to use equations to find the unit rates.

Inches per hour for City A

inches $\rightarrow \frac{21}{12} = 21 \div 12 = 1.75$
hours $\rightarrow 12$

Inches per hour for City B

inches $\rightarrow \frac{27}{15} = 27 \div 15 = 1.8$
hours $\rightarrow 15$

Since $1.8 > 1.75$, City B receives more snow per hour than City A. Using either method, City B has the heavier snowfall rate.

Use the next page to start a conversation about unit rates.

minutes

4	1
1	$\frac{1}{4}$

TABLE 2

Pounds	Dollars
4	2
2	1
1	$\frac{1}{2}$

TABLE 3

Inches	Hours
5	2
$\frac{5}{2}$	1
1	$\frac{2}{5}$



What patterns do you notice between all three tables?

SESSION 1

Explore Unit Rates**Learning Targets**

- Use division to find unit rates.
- Use unit rates to find equivalent ratios and compare ratios.
- Use unit rates to convert measurement units.

LESSON 16 • Use Unit Rates to Solve Problems

Curriculum Associates, LLC. All rights reserved.
Use for Teacher Toolbox Materials.

Start**Which Would You Rather?**

Run for . . .

 $\frac{1}{2}$ mile

5 times per week

 $1\frac{1}{3}$ miles

3 times per week

A B

C

 $\frac{2}{5}$ mile

7 times per week

©Curriculum Associates, LLC Copying is permitted.

Unit-Level Resources

Unit 4: Ratio Reasoning: Unit Rates and Percent

Unit Game	<u>24</u>
Literacy Connection	<u>28</u>
Unit Assessment (Form A)	<u>32</u>



GAME

UNIT 4

Names: _____

Activity Battle

What You Need

- Recording Sheet
- Activity Cards
- number cube (1–6)
- 25 pennies or two-color counters
- 20 paper clips
- cup
- stopwatch or clock with a second hand

Directions

- Your goal is to perform experiments, calculate probabilities, and compare results with your opponent.
- Shuffle the Activity Cards and place them facedown. Decide who will go first.
- Player 1 takes an Activity Card and reads it aloud. The activity has two choices: Option A and Option B. Player 1 selects an option.
- Player 1 performs the activity on the card according to the chosen option and calculates the result on the **Recording Sheet**.
- Player 2 then performs the same activity following the other option on the card and calculates the result on the **Recording Sheet**.
- Compare results. The player with the greater value wins that round.
- Play continues for six rounds. The player with the most wins at the end of six rounds wins the game.

Sample Recording Sheet



GAME
UNIT 4

Names: **Jen, Matt**

Activity Battle

RECORDING SHEET

Round	Player 1 <u>Jen</u> Calculation	Player 2 <u>Matt</u> Calculation	Winner
1	Rolled a 3: 3 times Number of rolls: 20 $\frac{3}{20} \times \frac{5}{5} = \frac{15}{100}$ $\frac{15}{100} = 15\%$	Rolled a 3: 2 times Number of rolls: 10 $\frac{2}{10} \times \frac{10}{10} = \frac{20}{100}$ $\frac{20}{100} = 20\%$	Matt
2			
3			



Activity: Roll a number cube. Record the number of times you roll the number 3. Find the percent of rolls that resulted in the number 3.

Option A: Roll the number cube 10 times.

Option B: Roll the number cube 20 times.



GAME
UNIT 4

Names: _____

Activity Battle

RECORDING SHEET

Round	Player 1 Calculation	Player 2 Calculation	Winner
1			
2			
3			
4			
5			
6			



GAME

UNIT 4

Names: _____

ACTIVITY CARDS



Activity: Roll a number cube. Record the number of times you roll the number 3. Find the percent of rolls that resulted in the number 3.

Option A: Roll the number cube 10 times.

Option B: Roll the number cube 20 times.

Activity: Write the letter "A" as many times as you can in the given amount of time. Have your partner use a stopwatch or a clock to time you. Use your results to calculate the number of As you could write in 1 minute at the same rate.

Option A: Write for 20 seconds.

Option B: Write for 12 seconds.

Activity: Flip a penny. Record the number of times the penny lands heads up. Find the percent of flips that resulted in heads up.

Option A: Flip the coin 10 times.

Option B: Flip the coin 5 times.

Activity: Place 20 paper clips next to a cup. Use only one hand to pick up each paper clip, one at a time, and put it in the cup. Have your partner use a stopwatch or a clock to time you. Use your results to calculate the number of paper clips you could put in the cup in 1 minute at the same rate.

Option A: Pick up paper clips for 10 seconds.

Option B: Pick up paper clips for 15 seconds.

Activity: Set a cup on the floor about 3 feet away from yourself. Toss each penny, one at a time, attempting to get it in the cup. Find the percent of tosses that land in the cup.

Option A: Toss 20 coins.

Option B: Toss 10 coins.

Activity: Place a cup by your feet and close your eyes. Without bending over, drop each paper clip, one at a time, attempting to get it into the cup. Find the ratio of paper clips that land in the cup to the total number of drops.

Option A: Drop 12 paper clips.

Option B: Drop 18 paper clips.



GAME

UNIT 4

Names: _____

ACTIVITY CARDS *continued*

Activity: Link together as many paper clips as you can in the given amount of time to make a chain. Use your results to calculate the number you could link together in 1 minute at the same rate.

Option A: Link paper clips for 15 seconds.

Option B: Link paper clips for 20 seconds.

Activity: Roll a number cube. Record the number of times you roll the number 5. Find the ratio of rolls that resulted in the number 5 to total rolls.

Option A: Roll the number cube 16 times.

Option B: Roll the number cube 12 times.

Activity:

Option A:

Option B:

Activity: Place the 25 pennies heads up in a straight row. Using only one hand, turn over as many pennies as you can to show tails up. Have your partner use a stopwatch or a clock to time you. Use your results to calculate the number of coins you could turn over in 1 minute at the same rate.

Option A: Turn over coins for 12 seconds.

Option B: Turn over coins for 10 seconds.

Activity: Roll a number cube. Record the number of times you roll an even number. Find the percent of rolls that resulted in an even number.

Option A: Roll the number cube 25 times.

Option B: Roll the number cube 20 times.

Activity:

Option A:

Option B:

Vivian's Move

by Miguel Pereira

1 On a gray, rainy morning, Vivian waved goodbye to the red door she had walked through for the last time. She waved goodbye to her bus stop, which looked lonely in the rain. She waved goodbye to her favorite bakery, the grocery store, and the neighborhood softball field, which was a swirl of cold, brown mud. She waved goodbye to the frozen Charles River, and a tear fell down her face as she watched Boston vanish in the rearview mirror of the truck they had rented to move their lives across the country.

2 Vivian had known for over six months that she was going to move to San Francisco, but she didn't want to believe it. Boston had been her home since she was born; it was all she knew, and she loved it. After all, Boston had the best Italian food, beautiful buildings, subways, and—most importantly—her friends. What would she do in a new city without her friends?

3 For the past couple of months, Vivian and her dad had been reading about San Francisco and California. He wanted her to be excited, but she didn't care that San Francisco was on a beautiful bay with scenic hills. She didn't care that the city was known for having some of the best food in the world. She didn't care about the spectacular Golden Gate Bridge and the warmer winters. Boston was beautiful and had wonderful restaurants, and she adored the fall leaves and the snowy winters.

4 Vivian and her dad took two and a half weeks to drive to San Francisco. By the time they crossed the California state line, they had driven through twelve states, four mountain ranges, three national parks, and countless cities and towns. Vivian felt exhausted from the long trip, and now she had to face the reality of why she was on the trip in the first place: California was her new home.

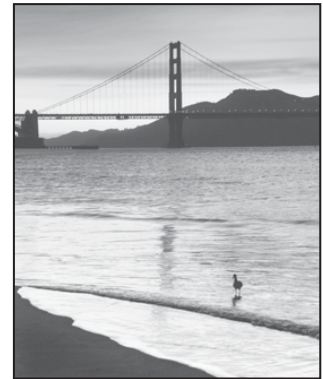
5 The book that said San Francisco is hilly was right. Vivian thought that “hilly” was an understatement. She felt like she was on a roller coaster as they drove through the steep hills of the city. She thought it was too bad that San Francisco didn't get snow like Boston does. These hills would be amazing for sledding! On the other hand, she thought about how much more fun the double-seated bike that she and her dad rode around Boston would be on these hills—at least going down!

6 After driving around for a while, Vivian's dad stopped the truck at the top of a hill in front of a house with a pink door. Her dad wasn't particularly excited about the bubble-gum-colored entrance, but Vivian was thrilled. The red door on their house in Boston suddenly didn't feel so far away. She ran through the door, up the stairs, and into the second room on the right, just like her dad had explained. This was her room, and it was perfect. It had blue walls, a slanted ceiling, and a circle window that looked out on the street. The movers already had set up her bed in the room. San Francisco was starting to feel more like home every minute.

Literacy Connection: **Realistic Fiction**

7 Vivian and her dad left their new house after several hours of unpacking to find somewhere to eat dinner. They found themselves in a part of town called North Beach. Vivian smiled when she saw restaurants with names like Mama Mia and Mangia Bene, and red, white, and green flags hanging in the windows. She was delighted to smell the delicious aromas floating in the air. She recognized that this was the Italian section of town and couldn't believe how similar it was to the North End in Boston.

8 Before going home, Vivian and her dad decided to take a trolley car to a nearby beach. They wanted to watch the sun set on their first day in San Francisco. When Vivian stepped off the trolley, she saw the waves lapping onto the beach in front of the silhouette of the Golden Gate Bridge. She wondered if it were possible for San Francisco to be as wonderful as Boston. So far, San Francisco was pretty great. She let out a sigh as she watched the sun turn colors and fade away. She thought about how her friends in Boston were probably asleep, and she wondered what new friends she would meet in San Francisco.





Vivian's Move

Unit Rates and Percent

► **Solve each problem. Show your work.**

- 1 Vivian and her dad drive from Boston to Niagara Falls. It takes them 9 hours to drive 495 miles.

a. What is their driving rate in miles per hour? Show your work.

SOLUTION _____

- b. Next, Vivian and her dad drive 4 hours to the Rock and Roll Hall of Fame in Cleveland, Ohio. If they drive at the same rate, how far do they travel? Show your work.

SOLUTION _____

- 2 Vivian and her dad visit Yellowstone National Park and then Arches National Park. It takes them 30 hours to drive the 1,770 miles from Cleveland to Yellowstone. It takes them another 9 hours to drive the 558 miles from Yellowstone to Arches. Did they travel faster on their way to Yellowstone or on their way to Arches? Show your work.

SOLUTION _____



LITERACY CONNECTION

Name: _____

UNIT 4

- 3 Vivian and her dad hike to Delicate Arch in Arches National Park. It takes them 90 minutes to hike 4.8 kilometers. What is their hiking rate in miles per hour? Show your work. (For every 10 miles, there are about 16 kilometers.)

SOLUTION _____

- 4 Vivian and her dad are driving from Arches National Park to San Francisco. They drive 240 miles, then stop for fuel. The place they stop is 25% of the distance from Arches National Park to San Francisco. What is the distance from Arches National Park to San Francisco? Show your work.

SOLUTION _____



UNIT 4 • UNIT ASSESSMENT

Name: _____

FORM A

► Solve the problems.

- 1 Natalena drives a moving van. She travels 372 mi in 6 h. At what speed does Natalena drive, in miles per hour? Draw a model. Show your work.

SOLUTION _____

- 2 Carson has a package to mail. The package is 87 cm long. The shipping company only mails packages that are up to 35 in. long. Can Carson mail the package? Show your work. (1 in. is about 2.54 cm)

SOLUTION _____

- 3 A paint store sells 4 pt of paint for \$19. Use a model to write a rate for this situation. What does this rate mean? Show your work.

SOLUTION _____



UNIT 4 • UNIT ASSESSMENT

Name: _____

FORM A continued

- 6 At a farmers market, a package of pears weighs 3 lb and costs \$9. Bananas are priced at 4 lb per dollar. Use rates to show which kind of fruit is more expensive per pound. Show your work.

SOLUTION _____

- 7 Chanasia buys a plastic bucket. The bucket weighs 460 g. The label on the bucket says *Made with 20% recycled plastic*. How many grams of recycled plastic are used to make Chanasia's bucket? Record your answer on the grid. Then fill in the bubbles.

⊖					
.	.	.	.	.	.
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9



UNIT 4 • UNIT ASSESSMENT

Name: _____

FORM A continued

- 8 Elizabeth buys a package of 360 marbles. She gives away 216 of the marbles. What percent of the marbles did Elizabeth give away? Show your work.

SOLUTION _____

- 9 Simmons and Magda do push-ups for exercise. Simmons does 42 push-ups in 360 s. Magda does 24 push-ups in 3 min. Who does push-ups at a faster rate? Show your work.

SOLUTION _____

- 10 A theater group has 400 members. So far, $\frac{5}{8}$ of the members have paid their yearly fees. What percent of the members have paid their yearly fees? How many members have paid their yearly fees? Show your work.

SOLUTION __________



UNIT 4 • UNIT ASSESSMENT

Name: _____

FORM A continued

- 11 Mrs. Doan spends \$36 at a carnival. This is 75% of the money she brings to the carnival. How much money does Mrs. Doan bring to the carnival? Record your answer on the grid. Then fill in the bubbles.

−							
.	.	.	.	.	.	.	.
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

- 12 Theo practices yoga for the same amount of time every day. After he practices yoga for 18 min on Saturday, he has finished 24% of his daily yoga practice. How many more minutes does Theo practice yoga on Saturday? Show your work.

SOLUTION _____

**FORM A** continued

- D 600**

$$\frac{\boxed{}}{\boxed{}} = \frac{\boxed{}}{100}$$
$$= \boxed{}\%$$

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



Classroom Mathematics California



Learn More at
ClassroomMathematicsCalifornia.com

To see how other educators are maximizing their
Classroom Mathematics California experience, follow us on social media!



@MyiReady



Curriculum Associates



@CurriculumAssoc



MyiReady



41600.0

© 2024 Curriculum Associates, LLC.
All rights reserved. | 12/24 1.1K | 2571938

Curriculum Associates