

Oregon Teacher Toolbox

Resource Sampler



Grade

6

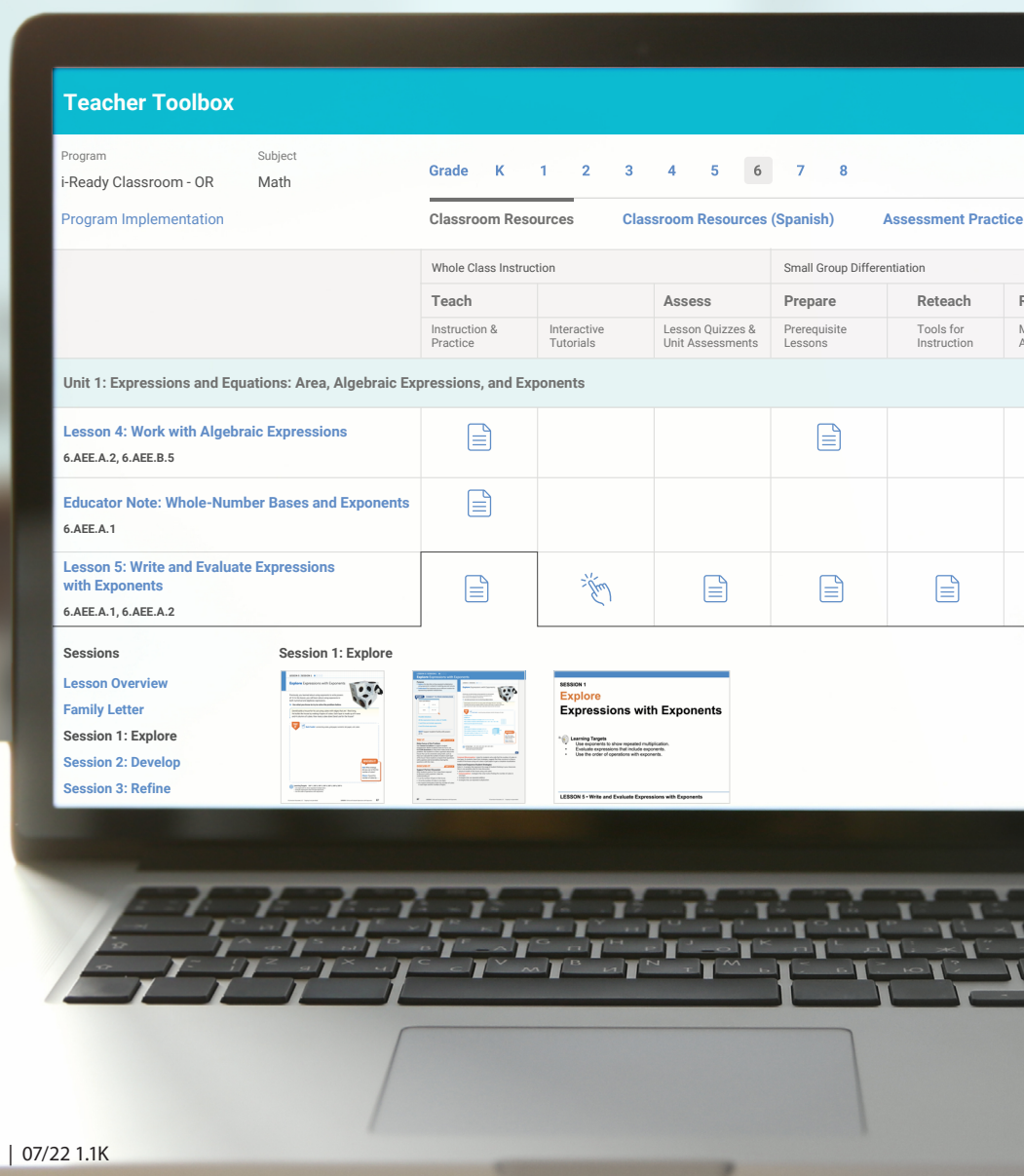
Engaging Resources to Drive

i-Ready Classroom Mathematics, Oregon Edition includes a wealth of resources to meet the needs of all learners. The Oregon Teacher Toolbox resources are accessible through the Teacher Digital Experience via i-ReadyConnect.com.

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

- Oregon Enhancement Activities ^{E/S}
- Activity Sheets ^{E/S}
- Assessments (*Lesson Quizzes, Practice Tests, and Unit Assessments—Forms A and B*) ^{E/S}
- Cumulative Practice ^{E/S}
- Develop Session Videos
- Digital Math Tools Powered by Desmos
- Discourse Cards ^{E/S}
- Graphic Organizers ^{E/S}
- Games (*Unit Level K–8 and Grade Level K–2*) ^{E/S}
- Enrichment Activities ^{E/S}
- Family Letters ^{E/S}
- Fluency and Skills Practice ^{E/S}
- Implementation Support

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

Program	Subject	Grade	K	1	2	3	4	5	6	7	8
i-Ready Classroom - OR	Math										
Program Implementation		Classroom Resources		Classroom Resources (Spanish)		Assessment Practice					
		Whole Class Instruction			Small Group Differentiation						
		Teach				Assess		Prepare		Reteach	
		Instruction & Practice		Interactive Tutorials		Lesson Quizzes & Unit Assessments		Prerequisite Lessons		Tools for Instruction	
Unit 1: Expressions and Equations: Area, Algebraic Expressions, and Exponents											
Lesson 4: Work with Algebraic Expressions 6.AEE.A.2, 6.AEE.B.5											
Educator Note: Whole-Number Bases and Exponents 6.AEE.A.1											
Lesson 5: Write and Evaluate Expressions with Exponents 6.AEE.A.1, 6.AEE.A.2											
Sessions		Session 1: Explore									
Lesson Overview											
Family Letter											
Session 1: Explore											
Session 2: Develop											
Session 3: Refine											

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Student Growth








- Interactive Tutorials 
- Literacy Connection Activities 
- Math Center Activities *(On Level, Below Level, and Above Level)* 
- Student Worktext PDFs 
- PowerPoint® Slides *(Editable)* 
- Prerequisite Lessons 
- Professional Learning Videos
- Teacher's Guide PDFs
- Tools for Instruction 
- Unit Flow & Progression Videos *(Closed Captioned in English and Spanish)*

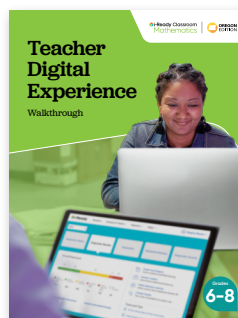
Table of Contents

This sampler includes some of the lesson- and unit-level resources available on Oregon Teacher Toolbox for **Unit 4: Ratio Reasoning: Unit Rates and Percent, Lesson 16: Use Unit Rates to Solve Problems.**

Enhancement
Activities
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Lesson-Level
Resources
[Page 9](#)

Unit-Level
Resources
[Page 26](#)



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.

Oregon Enhancement Activities

Oregon Enhancement Activities provide additional notes and activities to ensure all the Oregon Mathematics Standards are addressed.

EDUCATOR NOTE

OR

Whole-Number Bases and Exponents

Dear Educator,

In this lesson students will write and evaluate expressions involving whole-number exponents.

According to OR 6.AEE.A.1, students are not required to work with decimal or fractional bases.

One way to modify the content to fully meet this standard is to change decimal or fractional bases to whole-number bases in selected problems. Alternatively, omit problems that involve decimal or fractional bases.

Oregon Mathematics Standard

6.AEE.A.1 Write and evaluate numerical expressions involving whole-number bases and exponents.

PROVIDED EXAMPLE

Lesson 5, page 94, problem 8

Evaluate n^2 when $n = \frac{2}{3}$. Show your work.

SUGGESTED MODIFICATION

Evaluate n^2 when $n = 4$. Show your work.

GRADE 6 • Whole-Number Bases and Exponents

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EDUCATOR NOTE

OR

Percents, Fractions, and Decimals

Dear Educator,

In this lesson students will understand a percent as a rate per 100. They will relate percents to fractions using visual models and understand the relationship among percents, fractions, and decimals.

According to OR 6.RPA.3, students should also convert fractions to decimal notation.

One way to modify the content to fully meet this standard is to discuss the Start on page 391 in the Teacher Guide. Then have students express a given percent as a fraction and as a decimal. Continue to ask for fraction and decimal form in selected problems that only ask for the fraction.

Oregon Mathematics Standard

6.RPA.3 Use ratio and rate reasoning to solve problems in authentic contexts that use equivalent ratios, unit rates, percents, and/or measurement units.

PROVIDED EXAMPLE

Lesson 17, page 391, problem 2c

What fraction of their goal have the students reached?

SUGGESTED MODIFICATION

What fraction of their goal have the students reached? Write this fraction as a decimal.

GRADE 6 • Percents, Fractions, and Decimals

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Educator Notes

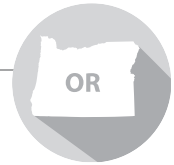
- Describe how the content in the *i-Ready Classroom Mathematics, Oregon Edition* instructional program varies from the expectations of the Oregon Mathematics Standards.
- Also include an example of how the content might be modified in order to better address the Oregon Mathematics Standards.

Educator Notes are provided when:

- Oregon Mathematics Standards require different content limits or vocabulary terms OR
- A clear modification can tailor the *i-Ready Classroom Mathematics, Oregon Edition* instructional program to address Oregon expectations



EDUCATOR NOTE



Whole-Number Bases and Exponents

Dear Educator,

In this lesson students will write and evaluate expressions involving whole-number exponents.

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One way to modify the content to fully meet this standard is to change decimal or fractional bases to whole-number bases in selected problems. Alternatively, omit problems that involve decimal or fractional bases.

Oregon Mathematics Standard

6.AEE.A.1 Write and evaluate numerical expressions involving whole-number bases and exponents.

PROVIDED EXAMPLE**Lesson 5, page 94, problem 8**

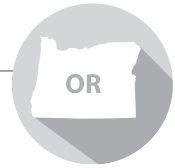
Evaluate n^3 when $n = \frac{2}{3}$. Show your work.

SUGGESTED MODIFICATION

Evaluate n^3 when $n = 4$. Show your work.



EDUCATOR NOTE



Percents, Fractions, and Decimals

Dear Educator,

In this lesson students will understand a percent as a rate per 100. They will relate percents to fractions using visual models and understand the relationship among percents, fractions, and decimals.

According to OR 6.RP.A.3, students should also convert fractions to decimal notation.

One way to modify the content to fully meet this standard is to discuss the Start on page 391 in the Teacher Guide. Then have students express a given percent as a fraction and as a decimal. Continue to ask for fraction and decimal form in selected problems that only ask for the fraction.

Oregon Mathematics Standard

6.RP.A.3 Use ratio and rate reasoning to solve problems in authentic contexts that use equivalent ratios, unit rates, percents, and/or measurement units.

PROVIDED EXAMPLE

Lesson 17, page 391, problem 2c

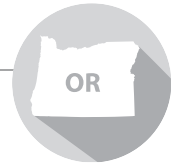
What fraction of their goal have the students reached?

SUGGESTED MODIFICATION

What fraction of their goal have the students reached? Write this fraction as a decimal.



EDUCATOR NOTE



Data Collection

Dear Educator,

In this lesson students will understand that a data set collected to answer a statistical question has distribution and can be described by the shape and variability.

According to OR 6.DR.B.2, students should collect and record data with technology to identify and describe the characteristics of data.

One way to modify the content to fully meet this standard is to ask students to collect their own data to answer statistical questions in selected problems.

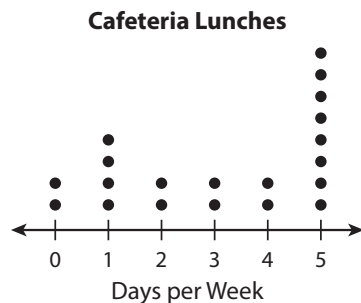
Oregon Mathematics Standard

6.DR.B.2 Collect and record data with technology to identify and describe the characteristics of numerical data sets using quantitative measures of center and variability.

PROVIDED EXAMPLE

Lesson 29, page 670, problem 5

Agustin collects the data set shown in the dot plot to answer the question *How many days each week do students in my class eat a cafeteria lunch?* Why is Agustin's question statistical? Describe the distribution of the data collected to answer this statistical question.



SUGGESTED MODIFICATION

Using technology, collect data from students in your class to answer the question *How many days each week do students in my class eat a cafeteria lunch?* Why is this question statistical? Then use technology to plot the data in a dot plot. Describe the distribution of the data collected to answer this statistical question.



“I love the rigor of the program,
and I love having access to all
grade levels of the [Teacher]
Toolbox. It allows me to
differentiate instruction within
each of my math groups.”

—**Mathematics Educator**

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Lesson-Level Resources

Lesson 16: Use Unit Rates to Solve Problems

Additional Practice

Fluency and Skills Practice [10](#)

Differentiation

Reteach: Tools for Instruction [12](#)

Reinforce: Differentiated Math Center Activities

On Level. [15](#)

Above Level [17](#)

Below Level [19](#)

Extend: Enrichment Activity [21](#)

Assessment

Lesson Quiz [23](#)



FLUENCY AND SKILLS PRACTICE

Name: _____

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?



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 long does it take him to install 495 square feet of flooring?
- 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? (10 blips is equivalent to 4 inches; 10 is 5 doubled, and 4 is 2 doubled)*
- 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? (Possible answer: Because 4 inches plus 8 inches is equal to 12 inches, you could add the corresponding number of blips as well: 10 blips plus 20 blips is equal to 30 blips.)*

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?* (20 inches are equal to 50 blips; 7.5 blips are equal to 3 inches; 12.5 blips are equal to 5 inches.)
- Say: *Explain how to use your table so that another student could make these conversions too.* (Possible answers: 5 blips times 10 is 50 blips, so multiply the corresponding number of inches, 2, by 10 to get 20 inches; 1 inch times 3 is 3 inches, so multiply the corresponding number of blips, 2.5, by 3 to get 7.5 blips; 4 inches plus 1 inch equals 5 inches, so add the corresponding number of blips, $10 + 2.5$, to get 12.5 blips.)

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. (20 paper airplanes)

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.



“I love the differentiated activities to enhance what the kids are learning in class. What a great way to practice the skills they are learning!”

—**Mathematics Educator**



CENTER ACTIVITY ●●

Names: _____

LESSON 16

**On Level is
shown here.**

Use Ratio and Rate Vocabulary

What You Need

- Recording Sheet

What You Do

KEEP IN MIND . . .

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

- 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.



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.



CENTER ACTIVITY ●●

Names: _____

LESSON 16

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

**Above Level is
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.



CENTER ACTIVITY ●●●

Names: _____

LESSON 16

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



CENTER ACTIVITY ●

Names: _____

LESSON 16

**Below Level is
shown here.**

Use Ratio and Rate Vocabulary

What You Need

- Recording Sheet

What You Do

KEEP IN MIND . . .

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

- 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.



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.



CENTER ACTIVITY ●

Names: _____

LESSON 16

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



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.



LESSON 16

- 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: _____

Digital Comprehension
Checks are also available.

► Solve the problems.

- 1 Jorgen 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? Record your answer on the grid. Then fill in the bubbles.

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

- 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.	<input type="radio"/>	<input type="radio"/>
b. Five gallons of gas would cost Alejandra \$17.50.	<input type="radio"/>	<input type="radio"/>
c. For \$45, Alejandra could fill an empty 13-gallon tank.	<input type="radio"/>	<input type="radio"/>
d. The cost of gas is \$3.50 per gallon.	<input type="radio"/>	<input type="radio"/>



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“I highly recommend the use of Teacher Toolbox beyond what words can even convey. Most importantly, the growth I see in students using the [Teacher] Toolbox resources is unmatched. And that’s what matters!”

—**Mathematics Educator**

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Unit-Level Resources

Unit 4: Ratio Reasoning: Unit Rates and Percent

Unit Game	27
Literacy Connection	30
Unit Assessment (Form A)	34



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.

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.

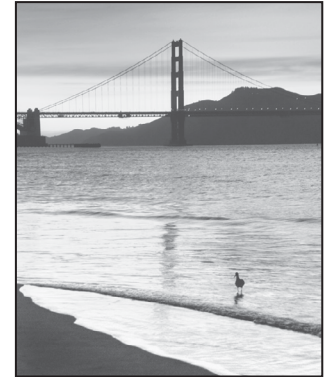
5 The book that said San Francisco is hilly was right. Vivian thought that “hilly” was an understatement. She felt like she was on a roller coaster as they drove through the steep hills of the city. She thought it was too bad that San Francisco didn't get snow like Boston does. These hills would be amazing 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.





LITERACY CONNECTION

Name: _____

UNIT 4

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.

Form A is shown here. Digital Comprehension Checks and Form B are also available.

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. = 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

- 4 Karla makes paper airplanes. Today, it takes her 32 min to make 16 paper airplanes. She plans to make paper airplanes for 96 min tomorrow and to work at the same rate. How many paper airplanes will Karla make tomorrow?
- A 192
- B 48
- C 6
- D 3
- 5 Benecio skis 748 yd in 3 min. At this rate, how many miles does Benecio ski in an hour? Record your answer on the grid. Then fill in the bubbles. (1 mi = 1,760 yd)

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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



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.

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3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8
9	9	9	9	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.

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0	0	0	0	0	0	0
1	1	1	1	1	1	1
2	2	2	2	2	2	2
3	3	3	3	3	3	3
4	4	4	4	4	4	4
5	5	5	5	5	5	5
6	6	6	6	6	6	6
7	7	7	7	7	7	7
8	8	8	8	8	8	8
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 _____



Name:

13 Ella makes cheesy broccoli casseroles. Her recipe calls for 7 cups of broccoli per 2 cups of cheese. How many cups of broccoli are needed for 42 cups of cheese?

- A** 3.5 **B** 12
C 147 **D** 294

- 14** A library sells 600 books for a fundraiser. The library claims that 60% of the books are fiction. How many of these books are fiction?

- A** 10 **B** 36
C 360 **D** 600

- 15** A barrel holds 21 qt of oil. Trina drains the barrel at a rate of 6 c per min. How long does it take her to empty the barrel? Show your work. (1 qt = 4 c)

SOLUTION _____

- 16 What percent of 125 is 90? Write your answers in the blanks.

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

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