

Connecticut Mathematics Model Curricula Alignment

Resource Name: [REVEAL MATH GRADE 6](#)

Alignment Grade 6				
Model Unit Name	Model Unit Standards	Resource Unit(s) Number	Resources Lessons	Pacing
<i>This is the title of the unit in the model curricula</i>	<i>These are the standards addressed in the unit</i>	<i>This is the unit(s) that aligns with the model unit from the resource</i>	<i>These are the lessons from the identified units that align to the standards within the model unit</i>	<i>This is the expected number of days for instruction</i>
Operating with Positive Rational Numbers	6.NS.A.1, 6.NS.B.2, 6.NS.B.3, 6.NS.B.4, 6.G.A.2	Module 3: Compute with Multi-Digit Numbers and Fractions Module 5: Numerical and Algebraic Expressions Module 9: Volume and Surface Area	Lesson 3-1: Divide Multi-Digit Numbers Lesson 3-3: Divide Whole Numbers by Fractions Lesson 3-4: Divide Fractions by Fractions Lesson 3-5: Divide with Whole and Mixed Numbers Lesson 5-5: Factors and Multiples Lesson 5-6: Use the Distributive Property	17 days

			Lesson 9-1: Volume of Rectangular Prisms	
Understanding Positive and Negative Numbers	6.NS.C.5, 6.NS.C.6, 6.NS.C.7, 6.NS.C.8	Module 4: Rational Numbers Module 6: Equations and Inequalities Module 7: Relationships Between Two Variables	Lesson 4-1: Represent Integers Lesson 4-2: Opposites and Absolute Value Lesson 4-3: Compare and Order Integers Lesson 4-4: Rational Numbers Lesson 4-5: The Coordinate Plane Lesson 4-6: Graph Reflections of Points Lesson 4-7: Absolute Value and Distance Lesson 6-6: Inequalities Lesson 7-3: Graphs of Relationships Lesson 7-4: Multiple Representations	22 days

Using Expressions and Equations	6.EE.A.1, 6.EE.A.2, 6.EE.A.3, 6.EE.A.4, 6.EE.B.5, 6.EE.B.6, 6.CC.B.7, 6.EE.B.8	<p>Module 5: Numerical and Algebraic Expressions</p> <p>Module 6: Equations and Inequalities</p> <p>Module 7: Relationships Between Two Variables</p> <p>Module 8: Area</p>	<p>Lesson 5-1: Powers and Exponents</p> <p>Lesson 5-2: Numerical Expressions</p> <p>Lesson 5-3: Write Algebraic Expressions</p> <p>Lesson 5-4: Evaluate Algebraic Expressions</p> <p>Lesson 5-6: Use the Distributive Property</p> <p>Lesson 5-7: Equivalent Algebraic Expressions</p> <p>Lesson 6-1: Use Substitution to Solve One-Step Equations</p> <p>Lesson 6-2: One-Step Addition Equations</p> <p>Lesson 6-3: One-Step Subtraction Equations</p> <p>Lesson 6-4: One-Step Multiplication Equations</p> <p>Lesson 6-5: One-Step Division Equations</p> <p>Lesson 6-6: Inequalities</p>	42 days
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			<p>Lesson 7-1: Relationships Between Two Variables</p> <p>Lesson 7-2: Write Equations to Represent Relationships Represented in Tables</p> <p>Lesson 7-3: Graphs of Relationships</p> <p>Lesson 7-4: Multiple Representations</p> <p>Lesson 8-1: Area of Parallelograms</p> <p>Lesson 8-2: Area of Triangles</p> <p>Lesson 8-3: Area of Trapezoids</p>	
Applications of Geometry	6.G.A.1, 6.G.A.3, 6.G.A.4	<p>Module 8: Area</p> <p>Module 9: Volume and Surface Area</p>	<p>Lesson 8-1: Area of Parallelograms</p> <p>Lesson 8-2: Area of Triangles</p> <p>Lesson 8-3: Area of Trapezoids</p> <p>Lesson 8-4: Area of Regular Polygons</p> <p>Lesson 8-5: Polygons on the Coordinate Plane</p>	20 days

			<p>Lesson 9-2: Surface Area of Rectangular Prisms</p> <p>Lesson 9-3: Surface Area of Triangular Prisms</p> <p>Lesson 9-4: Surface Area of Pyramids</p>	
Ratios and Rates	6.RP.A.1, 6.RP.A.2, 6.RP.A.3	<p>Module 1: Ratios and Rates</p> <p>Module 2: Fractions, Decimals, and Percents</p> <p>Module 10: Statistical Measures and Displays</p>	<p>Lesson 1-1: Understand Ratios</p> <p>Lesson 1-2: Tables of Equivalent Ratios</p> <p>Lesson 1-3: Graphs of Equivalent Ratios</p> <p>Lesson 1-4: Compare Ratio Relationships</p> <p>Lesson 1-5: Solve Ratio Problems</p> <p>Lesson 1-6: Convert Customary Measurement Units</p> <p>Lesson 1-7: Understand Rates and Unit Rates</p> <p>Lesson 1-8: Solve Rate Problems</p> <p>Lesson 2-5: Estimate the Percent of a Number</p>	21 days

			Lesson 2-6: Find the Whole	
			Lesson 10-7: Interpret Graphical Displays	
Algebraic Reasoning	6.EE.B.6, 6.EE.B.7, 6.EE.C.9	<p>Module 5: Numerical and Algebraic Expressions</p> <p>Module 6: Equations and Inequalities</p> <p>Module 7: Relationships Between Two Variables</p> <p>Module 9: Volume and Surface Area</p> <p>Module 10: Statistical Measures and Displays</p>	<p>Lesson 5-3: Write Algebraic Expressions</p> <p>Lesson 5-4: Evaluate Algebraic Expressions</p> <p>Lesson 6-1: Use Substitution to Solve One-Step Equations</p> <p>Lesson 6-2: One-Step Addition Equations</p> <p>Lesson 6-3: One-Step Subtraction Equations</p> <p>Lesson 6-4: One-Step Multiplication Equations</p> <p>Lesson 6-5: One-Step Division Equations</p> <p>Lesson 6-6: Inequalities</p> <p>Lesson 7-1: Relationships Between Two Variables</p>	30 days

			<p>Lesson 7-2: Write Equations to Represent Relationships Represented in Tables</p> <p>Lesson 7-3: Graphs of Relationships</p> <p>Lesson 7-4: Multiple Representations</p> <p>Lesson 9-1: Volume of Rectangular Prisms</p> <p>Lesson 10-3: Measures of Center</p>	
Statistics and Distributions	6.SP.A.1, 6.SP.A.2, 6.SP.A.3, 6.SP.B.4, 6.SP.B.5	Module 10: Statistical Measures and Displays	<p>Lesson 10-1: Statistical Questions</p> <p>Lesson 10-2: Dot Plots and Histograms</p> <p>Lesson 10-3: Measures of Center</p> <p>Lesson 10-4: Interquartile Range and Box Plots</p> <p>Lesson 10-5: Mean Absolute Deviation</p> <p>Lesson 10-6: Outliers</p>	11 days

			Lesson 10-7: Interpret Graphical Designs	
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Reveal Math® was designed based on a learning progression of mathematical content and connecting concepts across all grades and within each grade. A program scope and sequence is available in the Teacher Digital Center: Program Resources. In support of effective implementation and best practices, guiding principles of the instructional design & pedagogy, professional learning videos, and other program features can be found in the Teacher Digital Center: Program Resources.

Scope and Sequence			
If a district uses this resource to implement the state model curriculum for grade 6, the following scope and sequence should be followed to ensure alignment and attention to the progressions of mathematics.			
Unit Number/Title and Lessons	Lesson Objectives	# of days (assume 1 hour of instruction)	Number of weeks
Module 1: Ratios and Rates			
Lesson 1-1: Understand Ratios	Students will understand the concept of a ratio and how a ratio can be used to compare quantities.	2	3 Weeks 1 Day
Lesson 1-2: Tables of Equivalent Ratios	Students will understand what it means for two ratios to be equivalent and how a ratio table can be used to display and find equivalent ratios.	3	
Lesson 1-3: Graphs of Equivalent Ratios	Students will learn how to write ratios as ordered pairs and graph them on the coordinate plane.	2	

Lesson 1-4: Compare Ratio Relationships	Students will understand how multiple ratio relationships can be compared by graphing them on the same coordinate plane.	1	
Lesson 1-5: Solve Ratio Problems	Students will understand that they can use a bar diagram to model and solve a real-world problem involving ratios.	2	
Lesson 1-6: Convert Customary Measurement Units	Students will understand that they can use unit ratios to represent relationships between Customary units of measurement.	2	
Lesson 1-7: Understand Rates and Unit Rates	Students will understand how to compare quantities using rates and unit rates.	2	
Lesson 1-8: Solve Rate Problems	Students will understand that they can use bar diagrams to model and solve a real-world problem involving rates.	2	
Module 2: Fractions, Decimals, and Percents			
Lesson 2-1: Understand Percents	Students will use 10 x 10 grids and bar diagrams to model percents.	1	2 weeks 1 Day
Lesson 2-2: Percents Greater Than 100% and Less Than 1%	Students will use 10 x 10 grids to model percents that are greater than 100% and less than 1%.	1	
Lesson 2-3: Relate Fractions, Decimals, and Percents	Students will relate fractions, decimals, and percents.	3	
Lesson 2-4: Find the Percent of a Number	Students will use bar diagrams, equivalent ratios, double number lines, and ratio tables to find the percent of a number.	3	
Lesson 2-5: Estimate the Percent of a Number	Students will estimate the percent of a number.	1	

Lesson 2-6: Find the Whole	Students will find the whole given the percent and the part.	2	
Module 3: Compute with Multi-Digit Numbers and Fractions			
Lesson 3-1: Divide Multi-Digit Whole Numbers	Students will find quotients of multi-digit whole numbers.	2	2 Weeks 2 Days
Lesson 3-2: Compute with Multi-Digit Decimals	Students will perform operations on multi-digit decimals.	2	
Lesson 3-3: Divide Whole Numbers by Fractions	Students will divide whole numbers by fractions.	3	
Lesson 3-4: Divide Fractions by Fractions	Students will divide fractions by fractions.	2	
Lesson 3-5: Divide with Whole and Mixed Numbers	Students will divide with whole and mixed numbers.	3	
Module 4: Integers, Rational Numbers, and the Coordinate Plane			
Lesson 4-1: Represent Integers	Students will use integers on a number line to represent quantities.	2	3 Weeks 2 Days
Lesson 4-2: Opposites and Absolute Values	Students will find the opposites of integers and use opposites to understand absolute value.	2	
Lesson 4-3: Compare and Order Integers	Students will compare and order integers using a number line.	2	
Lesson 4-4: Rational Numbers	Students will reason about rational numbers using a number line.	2	
Lesson 4-5: The Coordinate Plane	Students will identify ordered pairs, points, and quadrants and graph ordered pairs on the coordinate plane.	3	

Lesson 4-6: Graph Reflections of Points	Students will graph reflections of points within the coordinate plane.	3	
Lesson 4-7: Absolute Value and Distance	Students will use absolute value to find the distance between points on the coordinate plane.	3	
Module 5: Numerical and Algebraic Expressions			
Lesson 5-1: Powers and Exponents	Students will write and evaluate powers.	2	3 Weeks 2 days
Lesson 5-2: Numerical Expressions	Students will write and evaluate numerical expressions.	2	
Lesson 5-3: Write Algebraic Expressions	Students will write algebraic expressions.	2	
Lesson 5-4: Evaluate Algebraic Expressions	Students will evaluate algebraic expressions.	3	
Lesson 5-5: Factors and Multiples	Students will solve problems by finding the greatest common factor and least common multiple of two whole numbers.	2	
Lesson 5-6: Use the Distributive Property	Students will use the Distributive Property to expand and factor expressions.	3	
Lesson 5-7: Equivalent Algebraic Expressions	Students will identify and generate equivalent algebraic expressions.	3	
Module 6: Equations and Inequalities			
Lesson 6-1: Use Substitution to Solve One-Step Equations	Students will use substitution to solve one-step equations.	1	2 Weeks 3 Days
Lesson 6-2: One-Step Addition Equations	Students will use the Subtraction Property of Equality to write and solve one-step addition equations.	3	
Lesson 6-3: One-Step Subtraction Equations	Students will use the Addition Property of Equality to write and solve one-step subtraction equations.	2	

Lesson 6-4: One-Step Multiplication Equations	Students will use the Division Property of Equality to write and solve one-step multiplication equations.	2	
Lesson 6-5: One-Step Division Equations	Students will use the Multiplication Property of Equality to write and solve one-step division equations.	2	
Lesson 6-6: Inequalities	Students will write, solve, and graph inequalities.	3	
Module 7: Relationships Between Two Variables			
Lesson 7-1: Relationships Between Two Variables	Students will identify and use independent and dependent variables in relationships.	3	1 Week 2 Days
Lesson 7-2: Write Equations to Represent Relationships Represented in Tables	Students will write equations to represent relationships.	2	
Lesson 7-3: Graphs of Relationships	Students will write equations and graph lines to represent relationships.	1	
Lesson 7-4: Multiple Representations	Students will use tables, equations, and graphs to represent relationships.	1	
Module 8: Area			
Lesson 8-1: Area of Parallelograms	Students will find and use the area of parallelograms.	2	2 Weeks 2 Days
Lesson 8-2: Area of Triangles	Students will find and use the area of triangles.	3	
Lesson 8-3: Area of Trapezoids	Students will find and use the area of trapezoids by composing and decomposing into other shapes.	2	
Lesson 8-4: Area of Regular Polygons	Students will find the area of regular polygons by decomposing the figure into other figures.	2	

Lesson 8-5: Polygons on the Coordinate Plane	Students will use the coordinate plane to draw and find attributes of polygons.	3	
Module 9: Volume and Surface Area			
Lesson 9-1: Volume of Rectangular Prisms	Students will find and use the volume of rectangular prisms.	2	2 Weeks
Lesson 9-2: Surface Area of Rectangular Prisms	Students will make nets and find surface area of rectangular prisms.	3	
Lesson 9-3: Surface Area of Triangular Prisms	Students will make nets and find surface area of triangular prisms.	3	
Lesson 9-4: Surface Area of Pyramids	Students will make nets and find surface area of pyramids.	2	
Module 10: Statistical Measures and Displays			
Lesson 10-1: Statistical Questions	Students will identify and use statistical questions.	1	2 Weeks 1 Day
Lesson 10-2: Dot Plots and Histograms	Students will construct dot plots and histograms using collected data.	1	
Lesson 10-3: Measures of Center	Students will understand and apply different measures of center.	3	
Lesson 10-4: Interquartile Range and Box Plots	Students will understand interquartile range and construct box plots.	1	
Lesson 10-5: Mean Absolute Deviation	Students will understand mean absolute deviation.	1	
Lesson 10-6: Outliers	Students will understand outliers and their effect on measures of center.	2	
Lesson 10-7: Interpret Graphical Displays	Students will interpret dot plots, histograms, and box plots.	2	

Supports of Diversity, Equity and Inclusion

Please provide any information relative to supporting culturally responsive instruction, multi-language learners, and students with disabilities

Culturally Responsive Instruction | Reveal Math

Drawing from research, McGraw Hill understands there are a number of factors that support classroom equity and echo the tenets of culturally responsive practices: high academic expectations for all students; a socially and emotionally positive classroom; a safe school climate; authentic and rigorous tasks; inclusive, relevant, and meaningful content; open and accepting communication; drawing from students' strengths, knowledge, culture, and competence; critically and socially aware inquiry practices; and strong teaching and teacher professional support for equity and inclusion.

McGraw Hill is committed to publishing pedagogically sound, high-quality, instructional materials that are fair, unbiased, and that recognize the unique contributions of people of all races and cultures. *Reveal Math* prides itself on exceeding the requirements for equal opportunity and representation in its program. We believe that all children should be able to see themselves as doers of mathematics and that means showing students from a range of genders, ethnicities, cultural backgrounds, and with different disabilities. McGraw Hill is also committed to producing materials that are free from cultural, ethnic or gender bias. Utmost care was taken to ensure an antiracist, anti-biased, nonsexist, and nonstereotyping presentation in the production of this resource.

The program displays males and females from various ethnic backgrounds in all types of environments, avoiding stereotypes. It provides every student with access and opportunities to learn. Throughout *Reveal Math*, all types of students are portrayed in all types of environments, so students of all backgrounds will be able to relate to the text.

The focus on Social Emotional Learning also provides multiple opportunities for students and teachers to recognize and value differences between home cultures of students and the classroom. Each lesson has an SEL focus in the Math in Mindset that is seen as part of the Be Curious Moment and reflection at the end of the lesson. These were designed using the CASEL Core Competencies in SEL.

Reveal Math grades 6-12 displays males and females from various ethnic backgrounds in all types of environments, avoiding stereotypes. It provides every student with access and opportunities to learn. Throughout *Reveal Math*, all types of students are portrayed in all types of environments, so students of all backgrounds will be able to relate to the text.

Each module open with an **Ignite! Activity** designed to spark all students' interest and curiosity. The Ignite activity is one example of an activity that provides students with opportunities to discuss individual interests and experiences. Lesson images and word problems portray a variety of demographics and cultural background. Mindset Matters tips provide students with opportunities to understand beliefs and how those beliefs impact student behavior and learning. The Multilingual eGlossary provides mathematics vocabulary translated into 13 common world languages.

Cultural Connections

Module activities highlight various cultural contributions to mathematics and require students to use a source to do additional research on the culture or topic.

Cultural Connections

Prime Numbers

Prime numbers are counting numbers greater than 1 that have no divisors other than 1 and themselves. It is thought that the ancient Egyptians had some knowledge of the prime numbers. However, the earliest surviving records of the study of prime numbers come from the ancient Greeks in about 300 BCE. Mathematicians have found that you may be able to use functions like $f(k) = k^2 - 79k + 1601$, where $k = 1, 2, 3, \dots$, to find prime numbers.

Prime	Composite
2	4
3	6
5	8
7	9
11	10
12	

Use a Source Research to find out more about the history of prime numbers.

To provide students with diverse perspectives, **Math History Minutes** highlight multicultural, global mathematics influencers, past and present, and describe how they impacted the world with their work and how different cultures provided a variety of contributions to the work.



Math History Minute
Graciano Ricalde Gamboa (1873–1942) was a Mexican mathematician who in 1910, achieved recognition for calculating the orbit of Halley's Comet. His precise calculations proved that the comet would not hit Earth, which was of great concern at the time. Halley's Comet follows a highly elliptical path and can be seen from Earth every 74–79 years.

Math History Minute

One of the oldest known forms of division is used by the Egyptians. For example, to divide 22 by 8, write multiplication sentences in which 8 is a factor. Find the numbers that create a sum of 22, the dividend. Because $16 + 4 + 2 = 22$, find the sum of the corresponding factors, $2 + \frac{1}{2} + \frac{1}{4}$, or $2\frac{3}{4}$. So, $22 \div 8 = 2\frac{3}{4}$.

1	8	$1 \times 8 = 8$
2	16	$2 \times 8 = 16$
1	2	$\frac{1}{2} \times 8 = 4$
1	4	$\frac{1}{4} \times 8 = 2$
1	8	$\frac{1}{8} \times 8 = 1$

Math History Minute

Early notations for negative numbers were used by the Chinese and Hindu mathematicians. The Chinese drew a diagonal stroke through the right-most non-zero digit to indicate a negative number and used red and black computing rods to indicate positive and negative values, respectively. The Hindu mathematicians placed a small circle above each negative value. Thus, 4 indicated -4 .



Math History Minute

Mathematician and astronomer **Muhammad al-Khwarizmi (around 780–850)** wrote the first known text in elementary algebra. The word *algebra* is derived from the word *al-jabr*, part of the title of this text. It means *reunion of broken parts* in Arabic. His texts were influential in bringing algebraic knowledge to Europe and were the first Arabic mathematics texts translated into Latin.

Additionally, the **Language Development Handbook**, Teacher Edition, includes Multicultural Teacher Tips throughout the handbook.

Please refer to the following link for further information on Equity and Cultural Responsiveness in *Reveal Math* 6-12:

[NA Reveal Math 6-12 Equity and Cultural Responsiveness](#)

Password: RevealCulturalResponsiveness

Multi-language learners and students with disabilities

Reveal Math addresses the needs for all students and a variety of tiered instructional resources are provided for remediation or enrichment. Each lesson includes a list of suggested **Differentiated** resources that is based on assessment data from the **Checks** after each **Example**. Remediation resources (**Review** resources) target prerequisite skill knowledge. Leveled **Questions for Mathematical Discourse** are also included for every Example in the Teacher Edition. The supplemental materials differ in K-5 and 6-12 based on the different nature of these classrooms and age appropriateness for students.

Reveal Math 6-12

Resources range from Remediation (**Review** resources) that target prerequisite skill knowledge to Enrichment (**Extension** resources) that extend student knowledge on the lesson topic. Each module has a readiness diagnostic and based on that, the teacher can use the embedded resources to support students in their classroom.

- The **Review Learn** and the **Review Example** are available to support students in acquiring pre-requisite skills.
- The **Take Another Look** Mini Lessons support students in remediation for the current topics under review.
- The **Personal Tutors** are available to support student understanding
- Online **Extension** activities are included for many lessons. In these activities, students extend their understanding of mathematical topics related to the lesson.
- The Teacher Edition includes **Enrichment Activity** suggestions at point-of-use for students who would benefit from a challenge or opportunity to extend their learning based on the checks in the lesson.
- In the Teacher Edition, **Questions for Mathematical Discourse** are included for each example to promote high expectations, critical thinking skills, and class discussion. On-level (OL) questions and beyond-level (BL) questions are appropriate for all students to answer, while approaching-level (AL) questions are included if students need more scaffolded support.
- The differentiated practice and assessment gives the teacher opportunities to support individual student needs.
- The Quick Review Handbook is included and targeted at point of use.
- A digital **Multilingual eGlossary** is provided that contains mathematics terms translated into 13 languages.

The Teacher Edition and the online resources support teacher guidance on which supports to use at the module and lesson levels.

1 CONCEPTUAL UNDERSTANDING

2 FLUENCY

3 APPLICATION

7.NS.A.3, 7.EE.B.4.A

Learn Write One-Step Equations

Objective

Students will learn how to model a real-world problem with a one-step equation.

Teaching Notes

SLIDE 1

Students will learn that they can model many real-world situations with equations. Have them select each flashcard to view the steps for writing an equation to represent a real-world problem. An important part of modeling a real-world problem with an equation is to define the variable. Remind students that the letter x is used often as a variable in algebra, but any letter can be used. In real-world situations, the first letter of the unknown quantity that the variable is representing is often used. For example, t is often used to represent temperature. Ask students if there are any other equations that can be used to model the real-world problem presented in the Learn. Sample responses can include $118 - t = 158$ and $t = 118 + 158$.

DIFFERENTIATE

Enrichment Activity **BL**

To further students' understanding of the importance of defining a variable, remind them that the equation describes the relationship between the quantities in the problem. If it is not clearly stated what the variable represents, then it can be difficult to interpret the solution in the context of the problem. Have students work in pairs to complete the following activity.

- Write a real-world problem that involves one operation in order to solve it.
- Model the problem with an equation, but do not clearly state what the variable represents.
- Trade problems and equations with another pair. Have them solve the equation. Then have each pair interpret the solution. If they struggle to do so, this may be because the variable was not clearly defined.

Learn Write One-Step Equations

Many real-world situations can be represented with equations. Consider the following problem. The highest recorded temperature in Phoenix, Arizona, is 118°F Fahrenheit. This is 158°F greater than the city's lowest recorded temperature. What is the lowest recorded temperature?

The steps show how to model the problem with an equation to represent the real-world situation.

Write

Describe the mathematics of the problem.

The highest recorded temperature is 118°F greater than the lowest recorded temperature.

Write

Define the variable to represent the unknown quantity.

Let t represent the lowest recorded temperature.

Equation

Translate the words into an algebraic equation.

$$118 = 158 + t$$

Choosing a variable and equation for the variable to represent in an equation is called defining a variable.

Review and Reflect

Did you struggle with any of the concepts in this Learn? How do you feel when you struggle with math concepts? What steps can you take to understand the concepts?

See students' observations.

Interactive Presentation

Learn, Write One-Step Equations

FLASHCARDS

On Slide 1, students use Flashcards to learn about the steps for modeling a real-world problem with a one-step equation.

Lesson 6-4 • Write and Solve One-Step Equations 285

Course 2 Teacher Edition, pg. 285: The **Differentiate** feature includes a **Beyond-Level (BL) Enrichment Activity**.

The **Extension** activities can be assigned to students who finish early or who need an extra challenge. These activities can be assigned to individual students, pairs of students, or a small group.

7.RP.A.1

1 CONCEPTUAL UNDERSTANDING 2 FLUENCY 3 APPLICATION

Example 1 Find Unit Rates

Objective
Students will find a unit rate in which one of the given quantities is a fraction.

Teaching the Mathematical Practices
 2 Reason Abstractly and Quantitatively As students discuss the *Talk About It* question, encourage them to use reasoning to determine that Tia can paint more than 36 square feet per hour, because she can paint 36 square feet in less than an hour.
 7 Look For and Make Use of Structure In Method 4, encourage students to understand that the structure of a complex fraction means that the numerator, the denominator, or both must be fractions.

Questions for Mathematical Discourse

SLIDE 2

AL Which number represents the number of square feet painted? the time, in hours? $36 : \frac{3}{4}$

OL How does the bar diagram represent the ratio? The bar diagram uses two bars to represent the two quantities 36 square feet and $\frac{3}{4}$ hour. The bars are the same length, with the same number of sections, to show that the two quantities are in a ratio.

BL What would the ratio $\frac{3}{4} : 36$ represent as a unit rate? the time, in hours, to paint one square foot

SLIDE 3

AL Where on the double number line is the ratio $36 : \frac{3}{4}$ represented? Both number lines begin at 0. The quantities 36 and $\frac{3}{4}$ are located the same distance from their respective 0s.

OL How does this double number line compare to the double bar diagram from Method 1? Both models show the ratio $36 : \frac{3}{4}$ by showing the quantities 36 and $\frac{3}{4}$ as the same location on each bar diagram.

BL How many square feet can Tia paint in three hours? 144 square feet

(continued on next page)

Example 1 Find Unit Rates

Tia is painting one side of her shed. She paints 36 square feet in 45 minutes.

At this rate, how many square feet can she paint each hour?

Think About It! Consider $\frac{3}{4}$ of an hour. So, this rate is 36 square feet per $\frac{3}{4}$ hour. You need to find this unit rate, the number of square feet she can paint per 1 hour.

Method 1 Use a bar diagram.
Draw two bars to model the ratio $36 : \frac{3}{4}$. Divide each bar into four sections. Because $\frac{3}{4}$ is a multiple of $\frac{1}{4}$, and there are 4 sections of $\frac{1}{4}$ hour in 1 hour.

To find the unit rate, find the value of each section in the bar representing square feet. Because three sections have a value of 36 square feet, each section has a value of $36 \div 3 = 12$ square feet. Because $4 \times \frac{1}{4} = 1$, the unit rate is 48 square feet per hour.

Method 2 Use a double number line.
The top number line represents the number of hours. The bottom number line represents the number of square feet. Mark and label the equal increments of $\frac{1}{4}$ on the top number line. Mark the same number of equal increments on the bottom number line. Each increment on the bottom number line represents 12 square feet. Because $4 \times 12 = 48$, the unit rate is 48 square feet per hour.

(continue on next page)

Interactive Presentation

Method 1 Use a bar diagram.
Draw two bars to represent the ratio $36 : \frac{3}{4}$. Divide each bar into four sections. Because $\frac{3}{4}$ is a multiple of $\frac{1}{4}$, and there are 4 sections of $\frac{1}{4}$ hour in 1 hour.

To find the unit rate, find the value of each section in the bar representing square feet. Because three sections have a value of 36 square feet, each section has a value of $36 \div 3 = 12$ square feet. Because $4 \times \frac{1}{4} = 1$, the unit rate is 48 square feet per hour.

Example 1 Find Unit Rates, Slide 2 of 5

DRAG & DROP
On Slide 2, students drag the quantities to label the bar diagram.

CLICK
On Slide 3, students move through the steps to see how a double number line can be used to solve the problem.

CHECK
Students complete the Check exercise online to determine if they are ready to move on.

Lesson 1-1 • Unit Rates Involving Ratios of Fractions 5

A core instructional belief of McGraw Hill's *Reveal Math* K-12 is that the learning of mathematics requires a focus on language and the language of mathematics. To support students' development of the language of mathematics, the program includes rich support for language development, for both native and non-native speakers of English.

Each lesson features a language objective in addition to a content and SEL (social and emotional learning) objective to highlight the importance of language development in the program. In addition, these features provide support and scaffolds for building students' mathematical language proficiency:

- **Language of Math (LOM)** strategies and features focus on mathematical and academic terms that students need to understand to be successful.
- **Math Language Development** support at the unit level offer support and strategies that teachers can use to help students build proficiency with language skills.
- **Math Language Routines (MLR)** found in each lesson are specifically designed to help English language learners build fluency with math language. These routines were developed by a team of educators and researchers at Stanford Graduate School of Education.
- **English Language Learner Supports** also found in each lesson provide scaffolded support at three levels of proficiency: Entering/Emerging, Developing/Expanding, and Bridging/Reaching. These three levels align to the WIDA levels: Entering, Beginning, Developing, Expanding, Bridging, and Reaching.

The Teacher Edition also has specific pedagogical suggestions for teachers based on the WIDA levels. These are included both at the Unit/Module and Lesson Levels.

There are robust Spanish resources for *Reveal Math*. There is a Spanish translation of the Student Edition and other resources. The Student Edition includes support for all students in vocabulary development, notetaking, and writing skills using word cards, vocabulary squares, three-column charts, definition maps, concept webs, and other graphic organizers, along with English/Spanish cognates in Dinah Zike's Visual Kinesthetic Vocabulary®.

As mentioned above, a course-level digital and print **Glossary** is provided with words translated into English and Spanish. For grades 6-12, a digital **Multilingual eGlossary** is provided that contains mathematics terms translated into 13 languages. Also, online are Math Replay Videos that provide additional support and review opportunities for concepts presented in the text.