

Lesson Walkthrough

Reveal
MATH[®]



Lesson Walkthrough

Unit Planner	Page 2
Readiness Diagnostic	Page 4
STEM Connections	Page 5
Lesson Opener	Page 6
Use Questions to Promote Student Ideas	Page 8
Build Understanding Through Exploration	Page 10
Purposeful Practice	Page 12
Assess to Inform Instruction and Differentiation	Page 14
Enrich Learning with Differentiated Resources	Page 16
Support for Multilingual Learners	Page 17
Math Probes by Cheryl Tobey	Page 18
Unit Review	Page 20
Assessment	Page 24

Unit Planner

Reveal Math includes a range of embedded supports to assist teachers in planning and providing effective learning experiences. In the Teacher Edition, the unit opens with at-a-glance information to help get planning started.

1. Ignite!

Collaborative activities are designed to engage students, spark curiosity, and motivate problem-solving. For more information, see page 12.

2. Math Probes

A formative assessment activity is found in every unit to uncover students' misconceptions. For more information, see page 40.

3. Mathematical Modeling

Students choose between two Mathematical Modeling tasks to complete at the end of each unit. For more information, see page 45.

UNIT PLANNER				
Proportional Relationships				
Pacing: 17 days* <small>*based off of a 90 min class session</small>				
LESSON	DURATION	MATH OBJECTIVE	LANGUAGE OBJECTIVE	SOCIAL AND EMOTIONAL LEARNING OBJECTIVE
Unit Opener Air Sensors and Purifiers with ionIQ	45 min			
3-1 Connect Ratios, Rates, and Proportions	90 min	Students describe a proportion as a comparison between two quantities.	Students distinguish between the different uses and definitions of multiple meaning words.	Students consider their responsibility in creating and maintaining a safe and welcoming math community.
3-2 Use Tables to Determine Proportionality	90 min	Students use tables to determine two quantities are in a proportional relationship. Students identify the constant of proportionality.	Students practice using academic language.	Students identify personal traits that can help them be proficient doers of math.
3-3 Use Graphs to Determine Proportionality	90 min	Students use graphs to determine proportional relationships.	Students ask and answer open-ended questions using <i>because</i> clauses.	Students identify criteria for success in the math classroom.
3-4 Represent Proportional Relationships with Equations	90 min	Students represent proportional relationships with equations in the form of $y = kx$.	Students practice justifying their thinking in speech and writing.	Students develop and refine strategies for building understanding of others' ideas.
3-5 Describe Proportional Relationships	90 min	Students describe proportional relationships using different representations.	Students recognize and respond to various question formation structures.	Students build proficiency with effective communication skills.
Math Probe	20 min			
3-6 Use Proportional Reasoning to Solve Multi-Step Ratio Problems	90 min	Students solve problems using proportional reasoning.	Students practice describing a process.	Students consider the applicability of mathematics to solving real-world problems.
Unit Review (independent practice)				
Mathematical Modeling	90 min			
Fluency Practice (independent practice)				
Unit Assessment	45 min			
Benchmark Assessment	45 min			



4

5

6

UNIT ESSENTIAL QUESTION:
How can you determine proportionality between two varying quantities?

KEY VOCABULARY		Academic Terms	MATERIALS TO GATHER	RIGOR FOCUS	STANDARD
3-1	Math Terms				
3-1	Equivalent ratios Proportion Unit rate	Adapt Transform	• timer	Conceptual understanding Procedural skill & fluency	7.RP.A.1 7.RP.A.2
3-2	Constant of proportionality Proportional	Display Identical	• <i>Constant Ratios Teaching Resource</i> • calculator	Conceptual understanding Procedural skill & fluency	7.RP.A.2 7.RP.A.2.a 7.RP.A.2.b
3-3	Constant of proportionality Proportional Unit rate	Accurate Inspection	• graph paper	Conceptual understanding Procedural skill & fluency	7.RP.A.2 7.RP.A.2.a 7.RP.A.2.b 7.RP.A.2.d
3-4	Constant of proportionality Proportional	Denote Explicit	• <i>Proportional Reasoning and Equations Teaching Resource</i> • colored pencils	Conceptual understanding Procedural skill & fluency	7.RP.A.2 7.RP.A.2.b 7.RP.A.2.c
3-5	Constant of proportionality Proportional Unit rate	Compute Reinforce		Conceptual understanding Procedural skill & fluency	7.RP.A.2 7.RP.A.2.b 7.RP.A.2.d
3-6	Proportion	Clarify Presume		Conceptual understanding Procedural skill & fluency	7.RP.A.2 7.RP.A.3

4. Key Vocabulary Math Terms

These lists include math-specific vocabulary that students should know and be able to use as they progress through each lesson in the unit.

5. Academic Terms

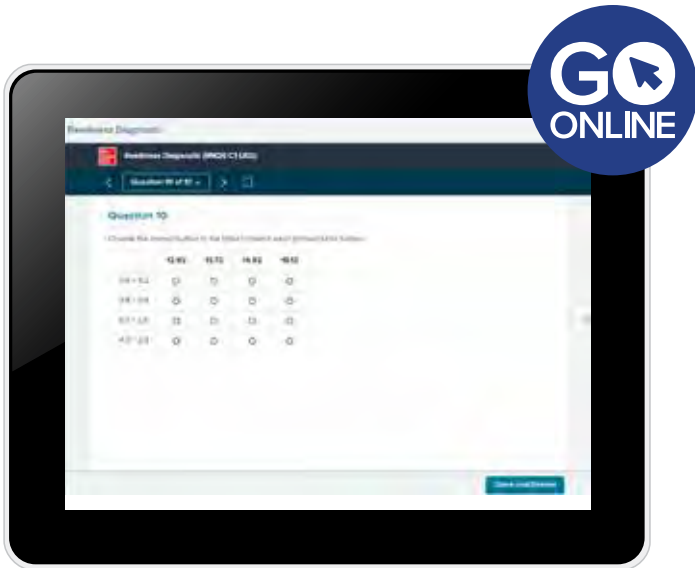
These lists include vocabulary that students will use throughout the lesson that is not specific to mathematics but will help to contextualize it through modeling and application.

6. Materials to Gather

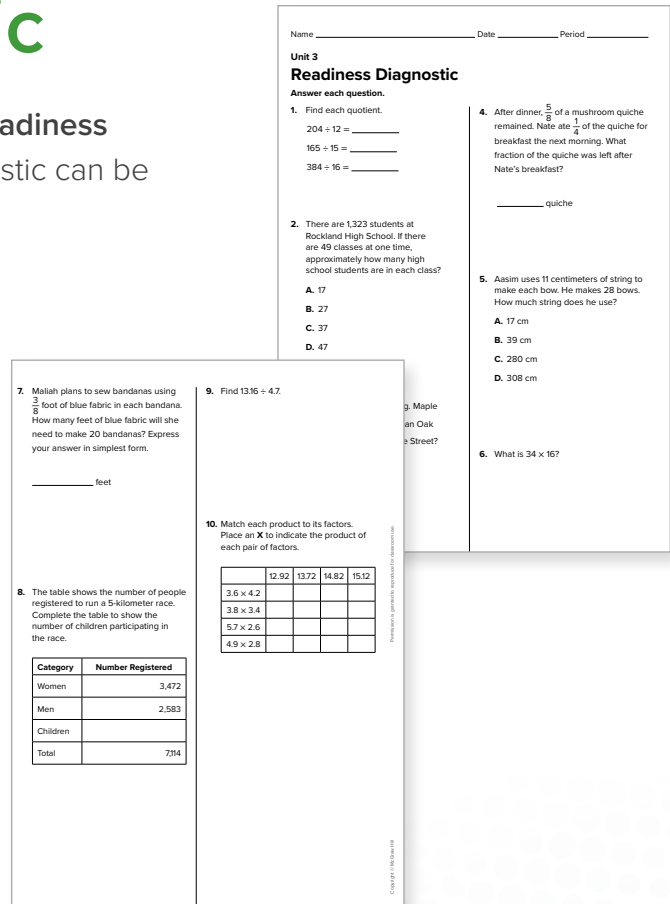
Teachers can know at a glance what classroom materials are needed for each lesson.

Readiness Diagnostic

Before beginning the unit, students complete the **Readiness Diagnostic** to identify any learning gaps. The diagnostic can be delivered online or in print.



Online Diagnostic



Print Diagnostic

Provide Targeted Intervention

The Teacher Edition includes an **Item Analysis** table which recommends **Guided Support Intervention Lessons** for students who need them. These lessons are assignable through the Digital Teacher Center.

Targeted Intervention

Use the Intervention Lessons recommended in the table to provide targeted intervention to students who need it. These lessons are available in the Digital Teacher Center and are assignable.

Item Analysis

Item	DOK	Skill	Guided Support Intervention Lesson	Standard
1	1	Divide whole numbers	2- and 3-Digit Dividends	5.NBT.B.6
2	2	Divide whole numbers	3- and 4-Digit Dividends	5.NBT.B.6
3	2	Add fractions	Add & Subtract Fractions (Equations)	5.NF.A.2
4	2	Subtract fractions	Add & Subtract Fractions (Equations)	5.NF.A.2
5	2	Multiply whole numbers	Multiply Multi-Digit by 2-Digit Numbers	5.NBT.B.5
6	1	Multiply whole numbers	Multiply Multi-Digit by 2-Digit Numbers	5.NBT.B.5
7	2	Multiply fractions and whole numbers	Multiplication of Mixed Numbers	5.NF.B.6

STEM Connections

Explore unit concepts through recognizable STEM scenarios.

- **Explore Through STEM** identifies a STEM scenario in the Unit Opener that sets the theme that will be revisited throughout the unit.
- **STEM Adventures** are digital activities where students can engage in experiments, make hypotheses, and apply mathematical knowledge to analyze data.
- The **Mathematical Modeling** tasks at the end of each unit tie back to the STEM scenario in the Unit Opener. See page 45 for an example of a Mathematical Modeling Task.



Lesson Opener

1. Lesson Progression

The Lesson Progression visualizes where teachers are in a unit and which lessons are ahead.

2. Learning Targets

Every lesson has two learning targets: one based on a concept or skill and one based on a math practice.

3. Lesson Objectives

Each lesson has three learning objectives: content, language, and Math Mindset.

4. Coherence

This section shows the learning progression for the content of the lesson.

5. Rigor

Every lesson focuses on one or more elements of rigor based on the content standards.

LESSON 3-5

Describe Proportional Relationships

1	LESSON 3-1 Connect Ratios, Rates, and Proportions	LESSON 3-2 Use Tables to Determine Proportionality	LESSON 3-3 Use Graphs to Determine Proportionality
----------	--	---	---

2 Learning Targets

- I can represent proportional relationships using table, graphs, and equations.
- I can make use of the structure of the equation $y = kx$ to describe a proportional relationship.

Standards ◇ Major △ Supporting ○ Additional

Content

- ◇ **7.RP.A.2** Recognize and represent proportional relationships between quantities.
- ◇ **7.RP.A.2.b** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
- ◇ **7.RP.A.2.d** Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.

Math Practices and Processes

MPP Reason abstractly and quantitatively.

Vocabulary

Math Terms	Academic Terms
constant of proportionality	compute
proportional	reinforce

Materials

The materials may be for any part of the lesson.

- rulers
- springs
- weights
- *Coordinate Plane Teaching Resource*

Focus		
<p>Math Objective</p> <ul style="list-style-type: none"> • Students describe proportional relationships using different representations. 	<p>Language Objectives</p> <ul style="list-style-type: none"> • Students recognize and respond to various question formation structures. • To optimize output, students will participate in <i>MLR: Compare and Connect</i> and <i>MLR: Stronger and Clearer Each Time</i>. 	<p>Math Mindset Objective</p> <ul style="list-style-type: none"> • Students build proficiency with effective communication skills.
Coherence		
<p>Previous</p> <ul style="list-style-type: none"> • Students determined the unit rate. (Grade 6) • Students identified proportional relationships, using tables, graphs, and equations. (Unit 3) 	<p>Now</p> <ul style="list-style-type: none"> • Students describe proportional relationships using different representations. 	<p>Next</p> <ul style="list-style-type: none"> • Students solve problems using proportional reasoning. (Unit 3) • Students graph proportional relationships and interpret the unit rate as the slope. (Grade 8)
Rigor		
<p>Conceptual Understanding</p> <ul style="list-style-type: none"> • Students deepen their understanding of ways to represent proportional relationships. 	<p>Procedural Skill & Fluency</p> <ul style="list-style-type: none"> • Students represent the multiplicative relationship between x, k, and y. 	<p>Application</p> <ul style="list-style-type: none"> • Students use the constant of proportionality to solve a real-world problem.

306 Unit 3 • Proportional Relationships

LESSON 3-4
Represent Proportional Relationships with Equations

6

LESSON 3-5
Describe Proportional Relationships

LESSON 3-6
Use Proportional Reasoning to Solve Problems

7

Lesson Highlights and Key Takeaways

In this lesson, students use different representations to make sense of proportional relationships. They identify the constant of proportionality using these different representations and interpret it in the context of the problem situation.

- Proportional relationships can be represented with tables, graphs, and equations.
- The constant of proportionality can be determined in each representation.

Math Background

Students' study of proportionality draws on concepts and skills students have gained in previous grades and units.

- **Plotting points** Grade 5 and Grade 6 students plotted points on the coordinate plane.
- **Division** Students have divided multi-digit numbers and will divide to find the constant of proportionality.
- **Unit rates** Grade 6 students determine unit rates and describe the unit rate as the constant of proportionality.
- **Equivalent ratio tables** Grade 6 students use tables to determine equivalent ratios.

6. Lesson Highlights and Key Takeaways

This section identifies the mathematical concepts a student will learn in the lesson.

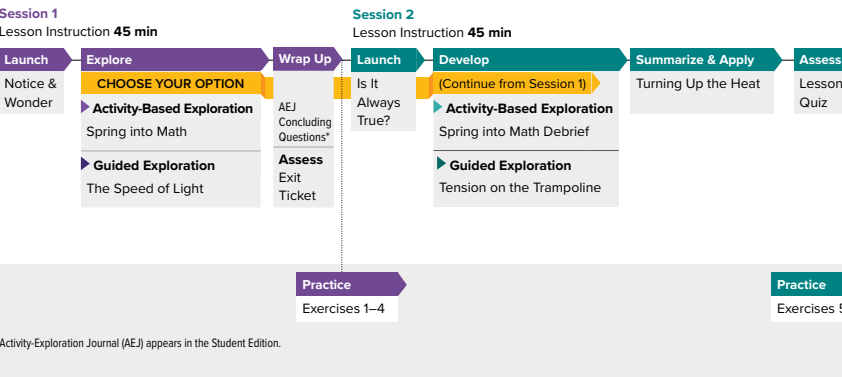
7. Math Background

Teachers are provided with an explanation of the mathematics concepts and skills taught in the lesson.

8. Lesson Pacing

This diagram gives teachers a visual of the lesson that spans two sessions. It also shows the flexibility of the lesson model, offering a choice between activity-based or guided exploration.

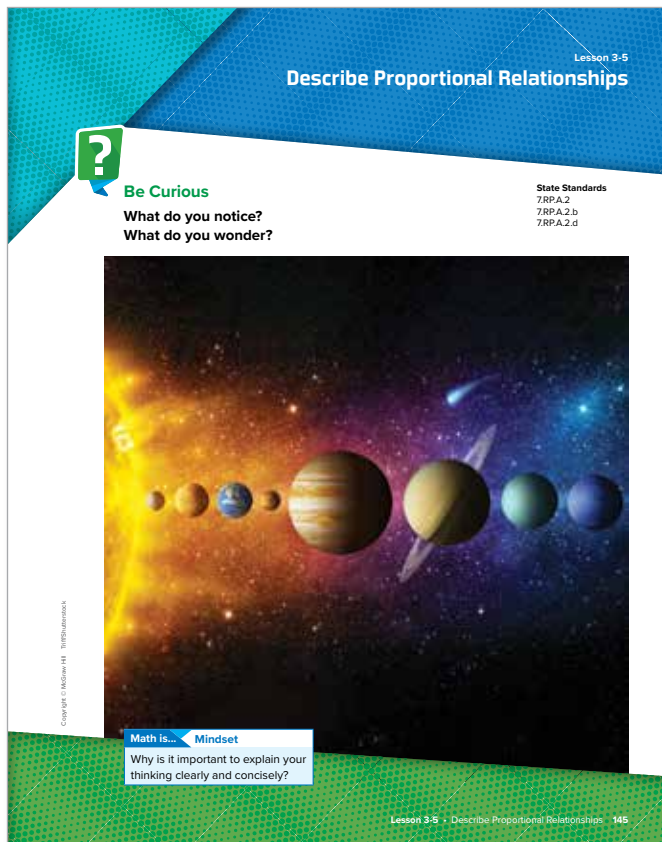
Lesson Pacing



Use Questions to Promote Student Ideas

Be Curious

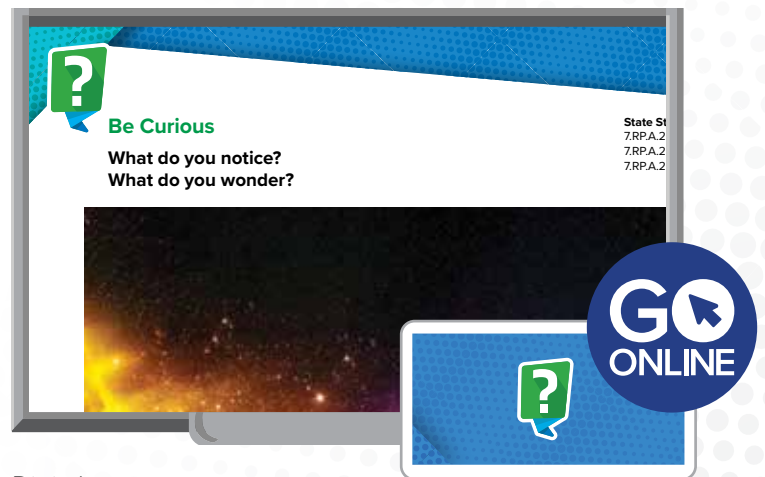
Be Curious, written by Annie Fetter, launches each session using a high ceiling, low floor sense-making activity with multiple entry points to help create an equitable classroom culture where all ideas are welcome and respected.



Print



Annie Fetter
Contributing Author



Digital

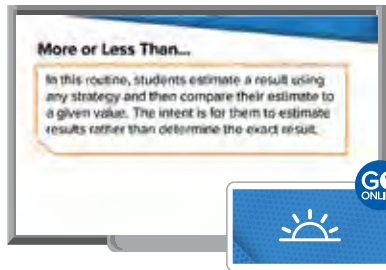
Number Routines

More or Less Than

Students build fluency with estimation strategies as they determine whether the value of a given expression is more or less than the target number.

These prompts encourage students to talk about their estimates:

- What numbers helped you think about your solution?
- How did you reason about the results?
- How does your strategy compare to ___'s?

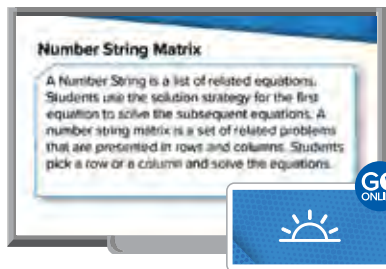


Number String Matrix

Students build fluency with operations as they use the solution to an equation to solve equations with the same digits with different base ten values.

These prompts encourage students to talk about their estimates:

- How are the factors related in the rows or columns?
- How does knowing 9×5 help you think about 90×500 ?
- What new problems could you solve because you know 9×5 ?



Number Routines

Every lesson includes two **Number Routines**, written by John SanGiovanni, M.Ed., that help students build number sense and proficiency with numbers. This supports their ability to fluently and flexibly apply strategies to solve problems.



**John SanGiovanni,
M.Ed.**

Contributing Author

Mathematical Discourse

In every lesson, students have the opportunity to engage in discussion about the math concepts from the lesson to build deeper understanding.

Orchestrating Rich Mathematical Discourse

In this lesson, students are introduced to and explore concepts related to ratio reasoning, a big idea in middle school mathematics. It's important that students have opportunities to engage in discussion about these concepts as they build their understanding of them. These suggestions from can help optimize the discussion of ratio concepts during either the Activity-Based or Guided Exploration.

1. Anticipate likely student responses.

- **Activity-Based Exploration:** As you plan for the lesson, think about the strategies your students are likely to use and misconceptions some students may have.
- **Guided Exploration:** As you plan for the lesson, review the questions in the teacher presentation and anticipate student responses to those questions. Think about which questions may pose challenges for students.

5 Practices for Orchestrating Productive Mathematical Discourse

Smith and Stein (2011)

1. **Anticipate** likely student responses.

2. **Monitor** students' thinking

3. **Select** student thinking to feature

4. **Sequence** student responses

5. **Connect** student thinking

Build Understanding Through Exploration

Teachers have their choice of two instructional strategies to facilitate student learning during the **Explore & Develop** phase:

Activity-Based Exploration

Students work together to explore concepts, develop and test hypotheses, and—most importantly—engage in productive struggle as they problem solve and generalize learning. Options for hands-on or digital activities are provided.

Guided Exploration

Teachers facilitate exploration through thoughtful discourse and collaboration using an interactive, digital presentation.

Explore - Session 1 20 min

CHOOSE YOUR OPTION

Activity-Based Exploration

Mixing Paint

181 Implement Tasks the Promote Reasoning and Problem Solving
Students explore different shades of green that can be made from mixing different amounts of blue and yellow paint. The goal is to have students notice that the ratio of blue to yellow paint will dictate the shade of green paint.
Students can work in pairs or small groups to carry out the task that they can complete in either the Digital Student Center or with paper and pencil.
Materials two-color counters (optional)

182 Support Productive Struggle

- What are some ways of getting different shades of green?
- How might the amount of blue and yellow paint mixed affect the shade of green?
- What do you notice about the amount of blue paint and yellow paint for each shade of green?

Math is... Choosing Tools

- What tools might help you track the different shades of green?

183 Encourage students to record and track their different combinations of blue and yellow paint in a tool of their choosing.

184 Elicit Evidence of Student Thinking
Some students may approach this task by completing a table with descending values for the blue paint in one column and ascending values for the yellow paint in a second column. Make sure students see the corresponding amounts of blue and yellow paint as related and defining of a particular shade of green.

Activity Debrief

185 Collect and Display
As students share their findings and their tools, listen for and write on the board any key words they use. Display the words and phrases for student reference. Use the student-generated expressions to help make connections between student language and math vocabulary.

186 Facilitate Mathematical Discourse
As students come up with different shades of green, ask them to look for patterns with the amount of blue paint and yellow paint for each shade of green.

- How can you describe a specific shade of green?
- Why do you think different amounts of blue paint result in different shades of green?
- What would you need to do to make a lot of paint that is a specific shade of green?

Introduce the term *ratio*, *part-to-part*, and *part-to-whole* in the debrief. Show bar diagrams to represent the part-to-part and part-to-whole ratios. Say:

- For this shade of green, the ratio of blue paint to yellow paint is [1] to [2]. This bar diagram shows that relationship. What is the ratio of blue paint to yellow paint for this shade of green? These are both part-to-part ratios. That is, both blue paint and yellow paint are parts of the green paint.
- For this shade of green, the ratio of blue paint to green paint is [1] to [3]. This bar diagram shows that relationship. What is the ratio of blue paint to green paint for this shade of green? These are both part-to-whole ratios. That is, the blue paint is part of the green paint.

Student Screen

Activity-Based printable available for this lesson. Download and print for students.

Guided Exploration

Pedro's Paint Mixture
Students explore the concept of ratios through a paint mixing situation. Introduce the problem situation. Have students consider why many hardware stores carry only white paint and create the exact color that a customer wants on the spot.

187 Pose Purposeful Questions

- Why might it be advantageous for a hardware store to carry only white paint and create specific color mixes that customers request?
- How would the hardware store be able to know that a color mixture matches the customer request?

188 Collaborate and Connect
For each of the different combinations of pieces of wood, have students work with a partner to determine whether the three pieces of wood can make a triangle. Ask:

- How do the three pieces of wood relate?

189 Collect and Display
As students discuss the questions, listen and write on the board any key words they use. Display the words and phrases for student reference. Use the student-generated expressions to help make connections between student language and math vocabulary. Update the collection with new understandings as the lesson progresses.

190 Use and Connect Mathematical Representations

- How does the blue paint relate to the green paint?
- What tools or models do you know that can represent this relationship?
- What do you think the bar diagram might look like? Draw the bar diagram.
- How are the different ways to write ratios related?

Students should notice that the terms are always in the same order.

191 Facilitate Meaningful Mathematical Discourse

- How can we represent a ratio?
- How can we describe a ratio?
- Explain why the blue paint to green paint is a part-to-whole ratio.
- How is the blue to yellow paint relationship different from the blue to green paint relationship?

Let's Explore More
Students work in partners or small groups to complete the questions. Check that students understand the difference between the blue to green and yellow to green ratio. Both are part-to-whole ratios, but use different parts.

192 Multilingual Learner Scaffolds
Entering/Emerging Support students in understanding the meaning of bar diagrams. Show a picture of bar graphs, both horizontal and vertical and ask students to point to the bars in the graph. Then have them point to the bars in the bar diagrams.
Developing/Expanding Check that students understand the meaning of bar diagrams. Show them some bar diagrams, both horizontal and vertical and ask them to describe the graphs. Encourage them to use bars in their descriptions. age them to use bars in their descriptions.
Bridging/Reaching Check students' understanding of bar diagrams. Ask them about other mathematical representations or models that have bars in them (bar graph) and to explain how the bars in the bar diagram are similar to those in the bar graph.

193 Multilingual Learner Scaffolds
Entering/Emerging Support students in understanding the meaning of bar diagrams. Show a picture of bar graphs, both horizontal and vertical and ask students to point to the bars in the graph. Then have them point to the bars in the bar diagrams.
Developing/Expanding Check that students understand the meaning of bar diagrams. Show them some bar diagrams, both horizontal and vertical and ask them to describe the graphs. Encourage them to use bars in their descriptions. age them to use bars in their descriptions.
Bridging/Reaching Check students' understanding of bar diagrams. Ask them about other mathematical representations or models that have bars in them (bar graph) and to explain how the bars in the bar diagram are similar to those in the bar graph.

18 Pedro's Paint Mixture
Pedro uses the best of paint stores to make green paint.
How can you describe the relationship between blue paint and green paint?
Between the blue paint and the yellow paint?

This is a **part-to-part** relationship or ratio.
2 to 5 or $2:5$ or $\frac{2}{5}$
2 to 5 or $2:5$ or $\frac{2}{5}$
2 to 5 or $2:5$ or $\frac{2}{5}$
2 to 5 or $2:5$ or $\frac{2}{5}$

Pedro uses 2 units of blue paint to make 5 units of green paint.

For every 2 units of blue paint, Pedro uses 5 units of yellow paint.

189 Let's Explore More
a. What is the ratio of blue paint to green paint? Write it in three different ways.
3 to 5, 3:5, $\frac{3}{5}$
b. What kind of ratio is the yellow paint to green paint relationship?
Write your thinking.
part-to-whole; The yellow paint is one part of the green paint (the whole). The other part is blue paint.
c. Pedro changed the ratio of blue to yellow paint to be 2:3. Describe the relationship with words.
For every 2 parts yellow there are 3 parts blue.

Student Edition, p. #

18 Unit 3 • Proportional Relationships

Unit 3 • Proportional Relationships 19



Effective Teaching Practices



Math Language Routines



Math Practices and Processes



Multilingual Learner Scaffolds

How Do I Choose?

Teachers can reference guidance in each Unit Opener or online in the Digital Teacher Center Unit Resources to help them decide which exploration to implement for lessons in a unit. The How Do I Choose? print and digital resources provide considerations for student engagement, scheduling, personal preference, and a variety of pairings or groupings.

How Do I Choose?

To decide which exploration is best for your class, consider the following:



▶ Activity-Based Exploration

- My students need practice working in pairs.
- During the **Be Curious** conversation, my students demonstrated they have the mindset to explore the concept on their own.

▶ Guided Exploration

- My students are engaged during class conversations.
- My students need practice presenting ideas to the entire class.
- My students struggled to see the math in the **Be Curious** conversation and need extra support to make connections during the **Explore & Develop**.



Digital Activity-Based Exploration



Digital Guided Exploration Presentation

Go Online and Explore!

Log in to the Digital Teacher Center to assign an interactive, digital Activity-Based Exploration to all or selected students. They can record their observations and findings in their Activity Exploration Journal.

If Guided Exploration is more suitable to class needs for the lesson, log in to the Digital Teacher Center to launch an interactive, digital presentation.

Purposeful Practice

Practice & Reflect

Practice & Reflect provides students with opportunities to solidify their understanding of the lesson concepts through independent practice pages. Two practice pages can be completed in the Interactive Student eBook or in the print Student Edition. Additional practice exercises are available online in Extra Practice with algorithmic question functionality, which changes question values upon attempt and includes learning aids.

For exercises 5 and 6, use a graph, table, or equation to represent the proportional relationships. Then answer the questions.

5. A bagger at a grocery store earns \$48.75 for working 5 hours. How much would she earn for working 1 hour? 12 hours?

6. At the farmer's market, Hans paid \$3.99 for 3 pounds of bananas. How much would he pay for 5 pounds of bananas?

For exercises 7 and 8, answer the questions.

7. The equation $y = 2.54x$ represents the relationship between centimeters and inches. What is the constant of proportionality and how could you use it to find the number of centimeters in 50 inches?

8. **Error Analysis** The graph shows the fee scale for a cleaning service. A sales representative says that the service charges \$25 per hour for cleaning. What feedback would you give the sales representative?

Reflect
Explain to a classmate how to determine if a relationship is proportional.

Math In... Mindset
Why was it important to explain your thinking clearly and concisely?

100 Unit 3 - Proportional Relationships

Name _____ Date _____ Period _____

Practice

For exercises 1-4, answer the questions.

1. The relationship between the recommended diameter of an exercise hoop and a person's height is shown. How do the diameters compare to the different heights?

Height (in.)	Diameter (in.)
58	29
60	32
62	31
64	32

2. Aspect ratio is the ratio of width to height of a television screen. The table shows the width and height of several different televisions. How does the width to height compare?

Width (in.)	Height (in.)
27.9	15.7
37.5	21.1
43.6	24.5
56.7	31.9

3. The number of points Imani earns while playing a video game is proportional to the number of stars that she collects. The graph of this relationship passes through the points (0, 0) and (2, 600). How can you use the information to determine the number of points Imani earns for collecting one star?

4. **STEM Connection** An engineer is studying the amount of time it takes to charge the battery for three different electric cars and the distance the car can travel on a fully charged battery. Is the relationship between the time and distance proportional? Explain.

Car	Full Charge Time (hours)	Miles on Full Charge
Car A	8	240
Car B	6	120
Car C	8	200

Lesson 2.5 • Describe Proportional Relationships 149

Print Practice



Additional Practice: Compare Ratio Relationships

63-05 Additional Lesson Practice (RM25-C)

Question 11 of 15

Question 11

Two bicyclists are traveling around the same track. The number of laps completed by bicyclist A and the time it took in minutes is shown in the table. The number of laps completed by bicyclist B and the time it took in minutes is shown in the graph.

Bicyclist A			
Number of laps	2	3	6
Time (in minutes)	3	10	15

Digital Practice

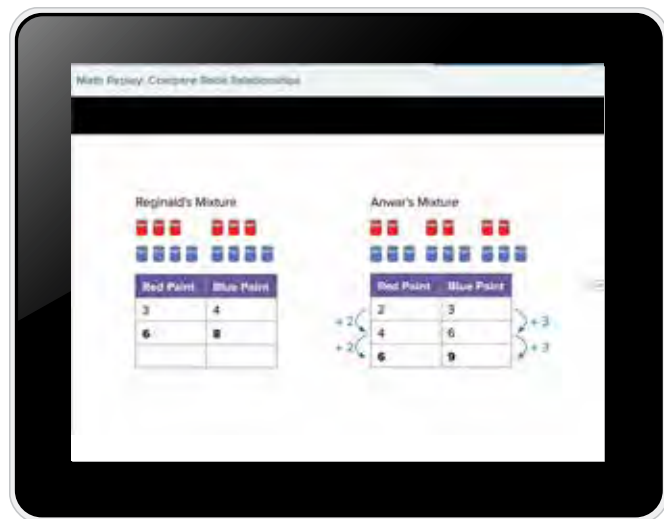
Applied Learning

Students complete exercises related to the lesson content. The exercises for each lesson target students' understanding of the concept or skill, their proficiency (fluency) with the skills, and include opportunities to apply the concepts and skills to new or unfamiliar situations. The section ends with a Reflect question that has students reflect on either the lesson concepts or specific mathematical thinking habits.



Math Replay Videos

Every lesson contains a one- to two-minute video explanation of the lesson concept for students to reference as they complete independent practice assignments.



To review today's lesson, have students watch the Math Replay video in their Digital Student Center.

Assign the On My Own practice to students from the Digital Teacher Center.



Assess to Inform Instruction and Differentiation

Name _____ Date _____ Period _____

Lesson 3-5
Exit Ticket

For item 1, use the information in the tables to complete the exercise.

The ratio tables show the number of red circles that Anna and Ruth each used in a design.

Anna			
Red Circles	3	6	9
Shapes	5	10	15

Ruth			
Red Circles	5	10	15
Shapes	8	16	24

1. Who has the greater ratio of red circles to shapes? Explain how you determined the answer.

Exit Ticket

At the end of Session 1, students demonstrate their understanding of lesson concepts by completing the **Exit Ticket**. Data from the Exit Ticket will help teachers inform instruction for the next session of that lesson.

Name _____

Lesson 3-5
Lesson Quiz

For item 1, use the tables to answer the question.

1. Each table represents an equivalent ratio. Complete the sentences.

Orange Juice			
Size (fl oz)	12	16	32
Cost (\$)	\$1.80	\$2.40	\$4.80

Grapefruit Juice			
Size (fl oz)	8	20	40
Cost (\$)	\$1.44	\$3.60	\$7.20

Based on the cost per fluid ounce, _____ juice is the less expensive drink. It is _____ cents per fluid ounce less expensive.

For item 2, use the graph to answer the question.

2. In the last 30 minutes, a car has traveled at a constant speed of 65 miles per hour on a highway. The graph shows the distance a train has traveled in the last 30 minutes.

Complete the sentence.
The _____ is traveling at a greater constant speed by _____ miles per hour.

For items 3 and 4, use the tables that show the ratio of chilies to all ingredients in two hot sauce recipes.

Recipe 1			
Chilies (g)	3	6	9
All Ingredients (g)	5	10	15

Recipe 2			
Chilies (g)	7	14	21
All Ingredients (g)	12	24	36

3. Which can you use as the second term in the ratio to compare the ratios of both recipes?
A. 24 B. 30 C. 42 D. 60

Lesson Quiz

At the end of Session 2, students complete the Lesson Quiz. Quiz data informs decisions for differentiation using the **Lesson Quiz Skill Tracker**.

Lesson Quiz Skill Tracker


The Lesson Quiz Skill Tracker in the Teacher Edition identifies Depth of Knowledge (DOK) and Standards covered by the Lesson Quiz to help teachers determine the next steps for each student based on quiz performance.

Lesson Quiz Skill Tracker			
Item	DOK	Skill	Standards
1	2	Compare ratios	6.RP.A.3
2	2	Compare ratios	6.RP.A.3.a
3	2	Compare ratios	6.RP.A.3
4	2	Compare ratios	6.RP.A.3.a

Differentiation for Diverse Learners


Robust differentiation resources help teachers meet the learning needs of students who would benefit from enrichment to extend learning or provide additional reinforcement for students requiring support.

B Build Proficiency
GO ONLINE
INDEPENDENT WORK



Assign

Interactive Additional Practice
Assign students either the print or digital assignment to practice lesson concepts. The digital assignment includes algorithmic exercises.



Assign

Spiral Review
Assign students either the print or digital version to review these concepts and skills.

- Recognizing Place Values and the Relation to Each Other

Additional Practice

For exercise 10, determine whether or not each operation is addition or subtraction.

1. $2 + 3 = 5$ **addition**

2. $4 - 1 = 3$ **subtraction**

3. $6 + 2 = 8$ **addition**

4. $9 - 4 = 5$ **subtraction**

5. $1 + 7 = 8$ **addition**

6. $3 - 2 = 1$ **subtraction**

7. $5 + 4 = 9$ **addition**

8. $8 - 3 = 5$ **subtraction**

9. $2 + 6 = 8$ **addition**

10. $7 - 1 = 6$ **subtraction**

Spiral Review

For exercise 10, determine whether or not each operation is addition or subtraction.

1. $2 + 3 = 5$ **addition**

2. $4 - 1 = 3$ **subtraction**

3. $6 + 2 = 8$ **addition**

4. $9 - 4 = 5$ **subtraction**

5. $1 + 7 = 8$ **addition**

6. $3 - 2 = 1$ **subtraction**


7. $5 + 4 = 9$ **addition**

8. $8 - 3 = 5$ **subtraction**

9. $2 + 6 = 8$ **addition**

10. $7 - 1 = 6$ **subtraction**

E Extend Thinking
GO ONLINE
INDEPENDENT WORK



Assign

STEM Adventures
In this STEM Adventure, students display, describe, and analyze data about daily household water consumption. Then they use statistics to investigate how water consumption is affected by wasteful or conserving behaviors and compare data sets.

Extend Thinking

For exercise 10, identify whether the question is statistical or not statistical. Then rewrite the question as it is to the other type. For example, if the question is statistical, rewrite the question as it is to be statistical.


1. In which year did Seattle receive the most rainfall?
not statistical
Answers will vary. Sample answer: What was the yearly rainfall in Seattle for each year over the last 50 years?

2. How many years were there 100 inches of rain?
statistical
Answers will vary. Sample answer: How many letters are in the alphabet?

3. How many years did it rain 100 inches?
not statistical
Answers will vary. Sample answer: How many cups of ice cream are in a pint of ice cream?

4. How many feet tall is the Empire State Building?
not statistical
Answers will vary. Sample answer: What are the heights of the buildings within a 4-block radius of the

R Reinforce Understanding
GO ONLINE
INDEPENDENT WORK



Assign

Take Another Look Lessons
Assign the interactive lessons to reinforce targeted skills.

- Statistical Questions
- Create Line Plots and Dot Plots
- Describe a Data Distribution

Reinforce Understanding

Students 10 questions have statistical or non-statistical. If a question does not have statistical, then it is not statistical.

1. How many books did you read last year?
statistical

2. How many books did you read last year?
not statistical

3. How many books did you read last year?
statistical

4. How many books did you read last year?
not statistical

5. How many books did you read last year?
statistical

6. How many books did you read last year?
not statistical

7. How many books did you read last year?
statistical

8. How many books did you read last year?
not statistical

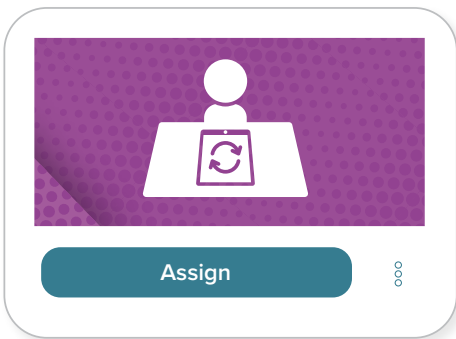
9. How many books did you read last year?
statistical

10. How many books did you read last year?
not statistical

Lesson Walkthrough *Reveal Math 6–8* | 15

Enrich Learning with Differentiated Resources

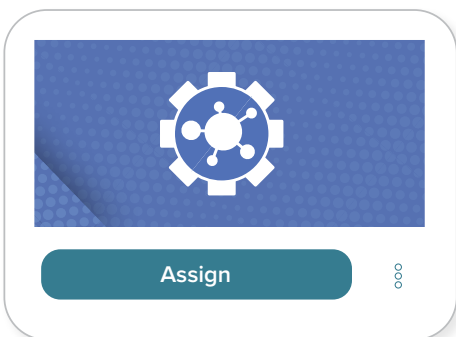
Reveal Math offers a variety of engaging, multi-modal activities with different delivery options to meet the individual needs of all students.



Take Another Look

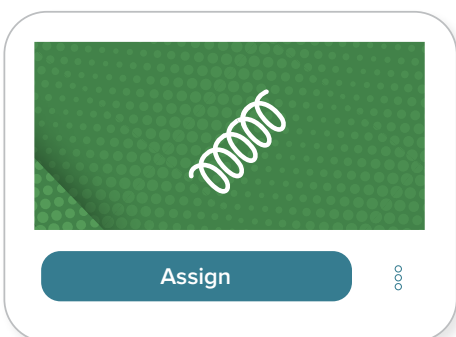
On-Level Reteach Mini-Lessons

Self-paced, digital mini-lessons consist of a three-part, gradual release activity: Model, Interactive Practice, and Check.



Extend Thinking Activities

Extend Thinking Activities challenge students who are ready to learn more. STEM Adventures is one Extend Thinking activity that involves students conducting experiments, making hypotheses, and analyzing data.



Spiral Review

Use the Spiral Review assignments at the end of a lesson to practice concepts presented in prior lessons.



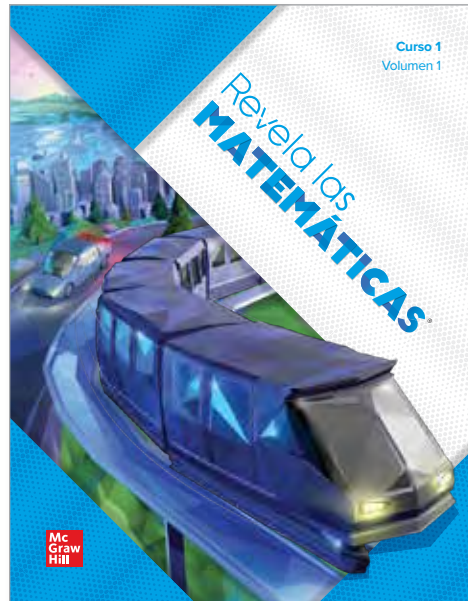
Digital Game Center

Digital Games help students become proficient with grade-level concepts in a fun and engaging practice environment.

Support for Multilingual Learners

In addition to Multilingual Language Scaffolds found in the Teacher Edition for each lesson, *Reveal Math* includes these components and resources to assist multilingual learners as they build language and mathematical proficiency:

- Spanish Student Edition
- English/Spanish Glossary
- Audio to improve listening comprehension skills
- ALEKS bilingual courses in Spanish



Spanish Student Edition

Math Language Development

Reveal Math is rife with mathematical language and specialized terms that may be new to students. Built-in academic language and text features help them grow their mathematical vocabulary and master key terms they are expected to know.

Math Language Development

Language Development - Academic Language

These mini-lessons focus on the academic terms listed in the Unit 3 planner.

Emerging/Entering

Write this sentence on the board and then read them aloud for the group.

*There are about [500] people in the photo on the Unit opener. Ask: Do we know the number of people in the photo? [No]. We can make a guess. A guess is an **estimate**. Let's estimate the number of [leaves on a tree/stars in the sky/people in a stadium]. Have students use this sentence frame: I estimate the number of... to be... Students can ask one another questions that lend themselves to estimates, such as, "Can you estimate the cost of...?" "I estimate the cost to be..."*

Developing/Expanding

Direct students to the Be Curious image in Lesson [x-x]. Say, *Let's analyze the different springs. What do we do when we **analyze** something?* [We look closely at it.] *What kinds of statement might we make when analyzing the springs?* [the number of values in each category] Write down students' ideas on the board or white board. Then have students work with a partner to analyze the data and then share out with the groups.

Bridging/Reaching

Display these two words: **estimate** and **predict**. Have students decide whether the statements below reflect estimating or predicting. *If I want to buy new sneakers and headphones, I'll need about \$200. I think our team will win the game tomorrow. It will probably take us 40 minutes to run 5 miles.* Have students discuss the difference between estimating and predicting.

Math Probes by Cheryl Tobey

Target Common Misconceptions

Math Probes, written by Cheryl Tobey, a leading expert in formative assessment, are designed to uncover students' mathematical misconceptions. These formative assessments, placed at the point-of-use in every unit, allow teachers to make sound instructional choices while teaching students that mistakes are an opportunity for growth.



Cheryl Tobey, M.Ed.
Contributing Author

Short, Formative Assessment

Each **Math Probe** features three to four items that assess students' conceptual understanding. Each item consists of two parts:

- **Part One** assesses students' understanding of concepts.
- **Part Two** asks students to share their thought process and ideas.

Name _____ Date _____ Period _____

Proportional Relationships

Circle the item(s) in each exercise that show a proportional relationship. You may select more than one item. Select none of the above if none of the items show a proportional relationship.

Circle your choice(s).	Explain your choice(s).
<p>1.</p> <p>A. $c = 3.75n$</p> <p>B. $p = 4m$</p> <p>C. $x = y$</p> <p>D. $y = x + 4$</p> <p>E. none of the above</p>	
<p>2.</p> <p>A. </p> <p>B. </p> <p>C. </p> <p>D. </p> <p>E. none of the above</p>	

Math Probe • Lesson Title: 151

Circle the item(s) in each exercise that show a proportional relationship. You may select more than one item. Select none of the above if none of the items show a proportional relationship.

Circle your choice(s).	Explain your choice(s).																														
<p>3.</p> <p>A. Aiden and Isabella are running at the same rate around a track. Isabella had already run 4 laps before Aiden started. How many laps had Aiden run after Isabella had run n laps?</p> <p>B. Riley can type 30 words in 14 seconds on her phone. At this rate, how many words can she type in m minutes?</p> <p>C. Javier paints 50 square feet in 1.25 hours. How long will it take Javier to paint x square feet?</p> <p>D. none of the above</p>																															
<p>4.</p> <p>A. <table border="1"> <tr><th>Time (h)</th><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><th>Number of Items</th><td>4</td><td>8</td><td>12</td><td>16</td></tr> </table></p> <p>B. <table border="1"> <tr><th>Number of Items</th><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><th>Cost (\$)</th><td>5</td><td>10</td><td>12</td><td>15</td></tr> </table></p> <p>C. <table border="1"> <tr><th>Gallons</th><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><th>Miles</th><td>25</td><td>50</td><td>75</td><td>100</td></tr> </table></p> <p>D. none of the above</p>	Time (h)	1	2	3	4	Number of Items	4	8	12	16	Number of Items	2	4	6	8	Cost (\$)	5	10	12	15	Gallons	1	2	3	4	Miles	25	50	75	100	
Time (h)	1	2	3	4																											
Number of Items	4	8	12	16																											
Number of Items	2	4	6	8																											
Cost (\$)	5	10	12	15																											
Gallons	1	2	3	4																											
Miles	25	50	75	100																											

152 Unit 3 • Proportional Relationships

Take Action

The teacher support materials that accompany the **Math Probes** are designed around a three-part ACT cycle:

- **Analyze** the probe.
- **Collect** and assess student work.
- **Take Action** to correct misconceptions quickly and efficiently.

A

Math Probe

Analyze the Probe ✓ Formative Assessment

Review the probe prior to assigning it to your students. In this probe, students will determine which item(s) in each set show a proportional relationship and explain their choices.

Targeted Concept Understand proportional relationships in equations, tables, and verbal descriptions in which there is a constant ratio between two quantities.

Targeted Misconceptions

- Students may not recognize a proportional relationship when given a form other than $y = mx + 0$.
- Students may incorrectly assume that any graph that forms a straight line is proportional.

Authentic Student Work

Below are examples of correct student work and explanations.

Correct Example A

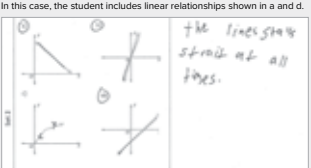
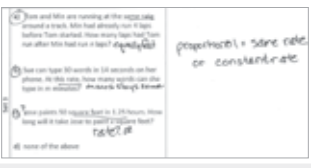
<p>Set 4</p> <p>a) Time (hour) vs Number of Bats</p> <table border="1" style="font-size: small;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>1/4</td><td>1/2</td><td>3/4</td><td>1</td></tr> </table> <p>b) Number of Bats vs Cost (\$)</p> <table border="1" style="font-size: small;"> <tr><td>2</td><td>4</td><td>6</td><td>8</td></tr> <tr><td>2.50</td><td>4.00</td><td>6.00</td><td>8.00</td></tr> <tr><td>2.50</td><td>4.50</td><td>6.00</td><td>8.00</td></tr> </table> <p>c) Calories vs Miles</p> <table border="1" style="font-size: small;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>1.50</td><td>3.00</td><td>4.50</td><td>6.00</td></tr> <tr><td>2.5</td><td>5.0</td><td>7.5</td><td>10.0</td></tr> </table> <p>d) none of the above</p>	1	2	3	4	1/4	1/2	3/4	1	2	4	6	8	2.50	4.00	6.00	8.00	2.50	4.50	6.00	8.00	1	2	3	4	1.50	3.00	4.50	6.00	2.5	5.0	7.5	10.0	<p>a + c are both through (0,0) and constant rate b doesn't seem to have a constant rate that I can find.</p>
1	2	3	4																														
1/4	1/2	3/4	1																														
2	4	6	8																														
2.50	4.00	6.00	8.00																														
2.50	4.50	6.00	8.00																														
1	2	3	4																														
1.50	3.00	4.50	6.00																														
2.5	5.0	7.5	10.0																														

Correct Example B

<p>Set 1</p> <p>a) $c = 3.75n$</p> <p>b) $p = 4m$</p> <p>c) $x = y$</p> <p>d) $y = x + 4$</p> <p>e) none of the above</p>	<p>$c = 3.75n$ $0 = 3.75(0)$ $0 = 0$</p> <p>$p = 4m$ $0 = 4(0)$ $0 = 0$ $p \neq d$ (p) not</p> <p>$x = y$ $0 = 0$ $y = x + 4$ $0 = 0 + 4$ $0 \neq 4$</p>
---	--

C

Collect and Assess Student Work

IF the student selects...	THEN the student likely...	Sample Misconceptions
1. d. Does not select a, b, and/or c	does not understand that for a relationship to be proportional, y must equal 0 when $x = 0$, or may not recognize a proportional relationship when given a form other than $y = mx + 0$.	
2. a and/or d	assumes that all linear relationships are proportional.	In this case, the student includes linear relationships shown in a and d. 
3. a and/or c	assumes that a constant rate of change automatically implies a proportional relationship.	In this case, the student assumes a constant rate for square feet per minute. 
4. b or d. Does not select a and/or c	does not understand that for a relationship to be proportional, each ratio has the same unit rate.	
*Combinations of correct and incorrect responses	Many of the above difficulties result in a combination of correct and incorrect responses. For correct responses, be sure to check for sound reasoning.	

Take Action

Choose from the following resources or suggestions.

- Provide opportunities for students to see the same proportional context in a variety of representations in order to make connections between the various components of each representation in Lesson 5.
- Have students compare and contrast proportional relationships with non-proportional relationships to help them generalize the characteristics of a proportional relationship. Focus on the key features of the proportional relationships in Lesson 3.
- To help solidify concepts, have students create, represent algebraically, solve, and share their own problems involving contexts of proportionality in Lessons 4 and 5. This gives students the opportunity to observe key features in others' representations.

Revisit the Probe After additional instruction, have students review their initial answers to the probe. Use these questions for discussion.

- What answers, if any, would you like to change? Why might you want to change them?
- What questions do you still have about any of the items in this probe?

Unit 3 • Proportional Relationships 321

T

Unit Review

Resources for Assessment Preparation

Teachers can select the appropriate review activities to prepare students for unit assessments.

Name _____ Date _____ Period _____

Unit Review

Revisit the **What Do I Already Know?** page and complete the **After** section of the chart.

Vocabulary Activity

Use the words from the word bank to complete each sentence. Some words may be more than once.

- constant of proportionality
- nonproportional
- proportion
- proportional
- proportional relationship
- ratio
- unit rate

- In a proportional relationship, the constant ratio is called the _____.
- Two quantities that do not relate by a constant multiple are _____.
- The relationship between two quantities is _____ if the ratios comparing the two quantities are equivalent.
- The constant of proportionality is also the _____.
- A _____ is an equation stating that two ratios or rates are equivalent.
- A _____ is a comparison between two quantities, in which for every a units of one quantity, there are b units of another quantity.
- There is no _____ in a nonproportional relationship.
- Two quantities are in a _____ if the two quantities vary and have a constant ratio between them.

Unit 3 • Proportional Relationships 15

Students can use the **Vocabulary Activity** in the Student Edition to review mathematical language and terminology.

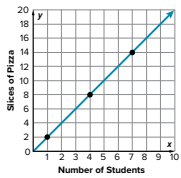
Review

For exercises 9-10, solve each problem.

- Last week, Karen sold 15 bracelets and made a profit of \$71.25. Assuming her costs and selling price stay the same, how much profit will she make from selling 25 bracelets? (Lesson X)
- Approximately how many pounds does a 2-kilogram jellyfish weigh? Round your answer to the nearest tenth. (Lesson X)

For exercise 11, select all statements that are true.

- The relationship between the number of slices of pizza purchased and the number of students served is shown in the graph. Which of the statements are true? (Lesson X)



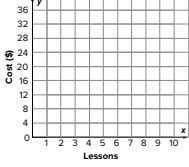
- The relationship is proportional.
- The point (9, 18) satisfies this relationship.
- The constant of proportionality is $\frac{1}{2}$.
- The constant of proportionality is 2.
- The graph shows that every two student had one piece of pizza.

For exercises 12-13, use the scenario below.
Mrs. Jameson paid \$202.50 for a group of 9 students to visit an amusement park.

- Write an equation that can be used to determine the cost for x students to visit the amusement park. (Lesson X)
- What would be the total cost if four more students wanted to join the group? (Lesson X)

For exercises 14-15, use the scenario below.
The cost of dance lessons is \$12 for 1 lesson, \$22 for 2 lessons, and \$32 for 3 lessons.

- Graph the ordered pairs on the coordinate plane. (Lesson X)



- Is the cost of dance lessons proportional to the number of lessons? Explain your reasoning. (Lesson X)

Unit 3 • Proportional Relationships 16

Review exercises prepare students for assessments with practice targeted to mathematical content standards.

Item Analysis Tables in the Teacher Edition align lesson content to Depth of Knowledge (DOK) levels and the Math Content Standard for each item.

Review

Item Analysis

Item	DOK	Lesson	Standards
9	3	3-6	7.RP.A.3
10	2	3-6	7.RP.A.3
11	2	3-3	7.RP.A.2; 7.RP.2.a
12	2	3-5	7.RP.A.2; 7.RP.A.2.c
13	2	3-5	7.RP.A.2.b
14	1	3-2	7.RP.A.2d
15	2	3-2	7.RP.A.2d

Fluency Progression and Practice

The Fluency Objective and Progression at the close of each unit helps teachers evaluate student progress. Fluency Practice provides students with opportunities to build procedural fluency.

Build Fluency Objective Students build fluency with decimals. As students work to develop fluency with adding, subtracting, multiplying, and dividing decimals, have them reflect on and share with classmates the strategies they find the most useful.

Fluency Progression

Unit	Skill	Standards
1	Division with Multi-Digit Decimals	6.NS.B.2
2	Fraction Multiplication and Division (no negative rational numbers)	6.NS.A.1
3	Apply Operations with Multi-Digit Decimals	6.NS.B.3
4	Finding Unit Rates Including Terms with Fractions	7.RP.A.1
5	Percent Increase and Percent Decrease	7.RP.A.3
6	Equations in Proportional Relationships	7.RP.A.2.C
7	Adding and Subtracting Positive and Negative Rational Numbers	7.NS.A.1
8	Multiplying and Dividing Positive and Negative Rational Numbers	7.NS.A.2
9	Two-Step Equations ($px + q = r$)	7.EE.B.4.A
10	Solving $px + q = r$	7.EE.B.4.A

1. Fluency Strategy

Students review the mathematical strategies.

2. Fluency Check

Students complete the practice.

3. Fluency Talk

Students explain the mathematical strategy.

Name _____ Date _____ Period _____

Fluency Practice

Fluency Strategy

Add or subtract decimals.	Multiply decimals.	Divide decimals.
Align the decimal points. Annex zeros, if needed. Add or subtract as with whole numbers.	Multiply. To place the decimal point, find the sum of the number of decimal places in each factor. The product has the same number of decimal places.	Multiply both the divisor and dividend by a power of 10 so that the divisor is a whole number. Divide. Place the decimal in the quotient directly above the decimal in the dividend.
$\begin{array}{r} 1 \qquad 6.10 \\ 4.560 \quad 26.70 \\ + 13.246 \quad - 3.45 \\ \hline 17.806 \quad 23.25 \end{array}$	$\begin{array}{r} 3.4 \\ \times 0.56 \\ \hline 204 \\ + 1700 \\ \hline 1.904 \end{array}$	$\begin{array}{r} 3.4 \\ 1.2 \overline{) 4.08} \\ \underline{-36} \\ 48 \\ \underline{-48} \\ 0 \end{array}$

Fluency Check

Add, subtract, multiply, or divide.

1. $5.1 + 8.2 =$ _____	5. $2.74 + 3.029 =$ _____
2. $7.68 - 1.49 =$ _____	6. $2.5 - 0.586 =$ _____
3. $2.3 \times 1.4 =$ _____	7. $0.85 \times 0.09 =$ _____
4. $55.9 \div 13 =$ _____	8. $3.6 \div 0.09 =$ _____

Fluency Talk

How would you describe the differences between operations with whole numbers and operations with decimal numbers to a classmate?

Copyright © McGraw-Hill

Fluency Practice • Proportional Relationships 165

Unit Review

Performance Task

For Part A through C, answer the question and include justifications.

Miranda and Juan want to rent bicycles for the afternoon. They will rent from either City Cycles or Biking Adventures. The rental rates are shown in the posters.

Part A

Which company should they rent from if they plan to rent bicycles for 2 hours or less?



Part B

Which company should they rent from if they plan to rent bicycles for 5 hours or less?



Part C

Miranda and Juan decide to rent for 3 hours. They find out that City Cycles charges a flat fee of \$2.50 to rent a bicycle helmet, but Biking Adventures includes helmet rental in the rental cost. From which store should they rent if they want to pay the lower price?

Unit Reflect

What helps you recognize a proportional relationship?

Copyright © McGraw Hill

Performance Task

Each unit culminates in two Performance Tasks that challenge students to apply skills from the current unit in real-world settings.

For each unit, one Performance Task is available in the Student Edition. A second, secure Performance Task is available in the Teacher Digital Center for use as an assessment. Teachers can navigate to the Assess section for the specific unit to assign the Performance Task.

Mathematical Modeling

The Mathematical Modeling tasks wrap up each unit with a real-world scenario related to the STEM unit focus and incorporating the Standards for Mathematical Practice. Students are provided with the opportunity to model with mathematics while utilizing appropriate tools to solve real-world problems and constructing viable arguments to present to their peers.

Students can choose between two different projects, increasing engagement and developing student agency. Teacher support is provided, including a guide for project development and facilitation.

Name _____ Date _____ Period _____

Mathematical Modeling

Measuring and Comparing Air Quality

The Air Quality Index (AQI) is a scale that informs the public on the quality of the air for the day. The AQI looks at five different pollutants in the air to determine air quality.

Air Quality Index (AQI) Values	Levels of Health Concern
0 to 50	Good
51 to 100	Moderate
101 to 150	Unhealthy to Sensitive Groups
151 to 200	Unhealthy
201 to 300	Very Unhealthy
301 to 500	Hazardous

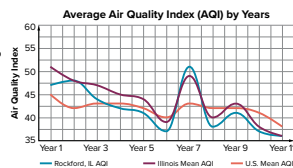
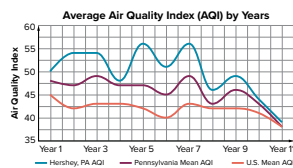
Choose one of the projects to complete.

Project One

The U.S. Olympic Committee is planning to build a new training facility for the track and field team. The committee is considering two possible locations: Hershey, Pennsylvania or Rockford, Illinois. Among the considerations for the new site is the average air quality. Good air quality is important for athletes, especially runners.

The graphs show the average air quality index for each site over a period of 11 years.

You are part of the site selection team and your team will make a recommendation to the U.S. Olympic Committee. Your task is to analyze the data in the graphs for the team. Consider the change in air quality over the ten-year period, noting any trends that you think might continue. Also consider the differences in the air quality for each specific site, for the state in which the site is located, and the country.



Unit 3 • Proportional Relationships 163

Project Two

The superintendent in your school district has received a complaint of poor indoor air quality in one of the district schools. Four key indicators of indoor air quality with maximum acceptable levels are described in the table.

Pollutant	Source	Level
Carbon Dioxide (CO ₂)	Exhaled air from human breathing; combustion processes of carbon fuels	< 1,000 parts per million (ppm)
Carbon Monoxide (CO)	Improperly vented furnaces, malfunctioning gas ranges,	< 9 ppm
Particle Pollution PM ₁₀	Particulates with a diameter of 10 micrometers or less. Includes dust from soil, pollen, mold, burning of wood, oil, or coal	< 50 mg/m ³ for one hour
Particle Pollution PM _{2.5}	Particulates with a diameter of 2.5 micrometers or less. Includes soot from diesel engines in trucks and buses	< 12.0 mg/m ³

The superintendent has asked you and your classmates to analyze the results of the air quality tests. What do the results shown in the table suggest about the indoor air quality at the school in question?

Pollutant	Reading 1	Reading 2	Reading 3	Reading 4
Carbon Dioxide (CO ₂)	729 ppm	1030 ppm	956 ppm	1106 ppm
Carbon Monoxide (CO)	4 ppm	5 ppm	3 ppm	5 ppm
Particle Pollution PM ₁₀	52 mg/m ³	56 mg/m ³	62 mg/m ³	58 mg/m ³
Particle Pollution PM _{2.5}	10 mg/m ³	10 mg/m ³	9 mg/m ³	10 mg/m ³

164 Unit 3 • Proportional Relationships

Assessment

Reveal Math offers a comprehensive set of diagnostic, formative, and summative assessments that allow teachers to effectively evaluate what students know and where they need additional instructional support and practice.

Name _____ Date _____ Period _____

Unit 3
Unit Assessment: Form A

Answer each question.

1. The table shows the distances and times of some of the world's fastest animals traveling at their top speeds.

Fastest Land Animals		
Animal	Distance (mi)	Time (h)
Blue wildebeest	$33\frac{1}{3}$	$\frac{2}{3}$
Brown hare	8	$\frac{1}{6}$
Cheetah	7	$\frac{1}{10}$
Elk	18	$\frac{1}{2}$

Write the names of the animals in order from least to greatest speed in miles per hour.

2. Hector walks 1,000 feet in $2\frac{1}{2}$ minutes. What is his unit rate?
 A. 400 ft per min
 B. 500 ft per min
 C. 2,000 ft per min
 D. 2,500 ft per min

3. Jana ran the first $3\frac{1}{2}$ miles of a 5-mile race in $\frac{1}{3}$ hour. What was her average rate, in miles per hour, for this first part of the race? Explain how you solved the problem.

4. A veterinarian recorded a cat's resting heart rate in the table. Find the constant of proportionality in beats per minute.

Number of Minutes	Number of Heartbeats
0.25	40
0.5	80
0.75	120

Unit Assessment Form A
59

Item Analysis

Item	DOK	Lesson	Guided Support Intervention Lesson	Standard
1	2	3-1	Compute Unit Rates—Complex Fractions	7.RP.A.1
2	2	3-1	Compute Unit Rates—Complex Fractions	7.RP.A.1
3	3	3-1	Compute Unit Rates—Complex Fractions	7.RP.A.1
4	3	3-2	Proportional Relationships—Tables	7.RP.A.2.a
5	2	3-2	Proportional Relationships—Tables	7.RP.A.2.a
6	1	3-3	Proportional Relationships—Graphs	7.RP.A.2.a
7	1	3-3	Proportional Relationships—Graphs	7.RP.A.2.a
8	2	3-2	Constant of Proportionality—Tables	7.RP.A.2.b
9	2	3-3	Constant of Proportionality—Graphs	7.RP.A.2.b

Item Analysis Tables identify Depth of Knowledge, targeted standards, and corresponding digital Intervention Lessons for students who need them.

Print Assessment



The screenshot shows a digital assessment interface. On the left, a tablet displays the 'Assess' page with 'Assessment Details' (Number of questions: 30, Time available: 1:00), 'Introduction', and 'Assignment Type'. On the right, two overlapping cards are shown for 'Unit Assessment Form A' and 'Unit Assessment Form B'. Each card features a red background with a white checkmark and a bar chart icon, and a blue 'Assign' button with a three-dot menu icon.


Digital Assessment

All *Reveal Math* assessments are available for either print or digital administration. Assessments can be found in the Assessment Resource Book or in the Digital Teacher Center. All digital assessment items, except for open response questions, are auto-scorable. Teachers can customize existing or create new assessments using additional item banks and item authoring tools. Each course includes thousands of dedicated assessment questions.

Type	Assessment	When	Description
Diagnostic	Course Diagnostic	Beginning of Course	Diagnoses students' strengths and weaknesses with prerequisite concepts and skills for the upcoming year.
	Unit Readiness Diagnostic	Start of the Unit	Evaluates students' knowledge of prerequisite concepts and skills for the upcoming unit.
Formative	Exit Tickets	During a Lesson	Assesses students' understanding of the concepts and skills following the Explore.
	Lesson Quiz	After a Lesson	Assesses student conceptual understanding with lesson concepts and skills.
	Cheryl Tobey Math Probes	During a Unit	Identifies common misconceptions.
Summative	Unit Assessment: Forms A and B	End of Unit	Evaluates students' understanding of concepts and skills learned in the unit.
	Unit Performance Task	End of Unit	Measures students' ability to apply concepts and skills learned in the unit.
	Benchmark Assessments	After Multiple Units	Assesses students' understanding of concepts and skills covering multiple units throughout the year.
	End-of-Year Assessment	End of Year	Evaluates students' mastery of course concepts and skills during the academic year.


Expert-Led Professional Learning

Self-paced, on-demand online professional learning resources included within *Reveal Math* ensure teachers and administrators have support from the beginning to the end of the year.




Quick Start

Teachers can get up to speed quickly with the *Reveal Math* resources and curriculum overview.



Digital Walkthrough

Digital platform guidance from a teacher-view and a student-view.



Instructional Videos

Reveal**MATH**[®]

Reveal the Full Potential in Every Student



Learn more at
mheonline.com/Reveal6-8Sample