

Domain (Unit/Category/Topic)	CCSS Code	Description of Standard	Example/Problem Types	Skills Focus	Number of Lessons	Lesson 1	Lesson 2	Lesson 3								
Ratios and Proportional Relationships	7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.	If a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{\frac{1}{2}}{\frac{1}{4}}$ miles per hour, equivalently 2 miles per hour.	Meaning of "unit rate"	1	Discuss and define unit rate. Identify unit rate as a rate with a denominator of 1. Define rate versus ratio—rate is a ratio that compares quantities in different units. KWL chart. Explore and find rates in real life. Write the rates and divide to find unit rate. Use ads for foods to determine unit rates in shopping.										
Ratios and Proportional Relationships	7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.	Find the unit rate: $\frac{15}{3} = \frac{5}{1}$ $\frac{20}{8} = 20 \div 8 = \frac{2.5}{1}$ \$3.99/2 lbs. What's the unit rate?	Unit rate with ratios of fractions  Like or different units	2	Review ratios, fractions, and percents. Write percents as ratios. Review rate and brainstorm rate examples in real world contexts and search for unit rates: rate, speed, mph, mpg, cost per pound, cost per ounce, cost per apple. Introduce unit cost. Show how rates can be converted into unit rate. Example: \$5.00 per 6 apples. How much does 1 apple cost? Use division and equivalent fractions to show unit rate with a denominator of 1.	<i>Snack Food Shopper</i> slideshow/presentation Research and find pictures and costs of snack food or cereal of different sizes. Determine the unit rate or unit cost of each food from at least 2 different package sizes. For example: snack-sized snack crackers versus regular bag; family-sized cereal box and small cereal box. What is the unit cost for each? Use unit rate to compare prices. Do they cost the same? Why or why not? Discuss and determine the better "deal" or lowest unit cost. Why would people pay the larger unit cost? Extensions - How do manufacturers use unit rate to sell products? If you found unit rate as cost per ounce, can you find cost per cracker?									
Ratios and Proportional Relationships	7.RP.A.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units.	Who is faster? A: 5 laps in 2 minutes B: 8 laps in 3 minutes	Unit rate with lengths and capacity	2	Use ratios of length to convert measurements. <i>Racing Through Ratios of Length</i> Solve scenarios and tasks involving measurements of length and converting customary units of length using unit rate. Compare rates by finding unit rate.	<i>Cooking Up Unit Rate</i> Solve word problems and tasks involving unit rate and ratios with standard units for capacity and weight. Which recipe has more? A: 5 cups of flour for every 2 cups of sugar B: 8 cups of flour for every 3 cups of sugar									
Ratios and Proportional Relationships	7.RP.A.2	Recognize and represent proportional relationships between quantities.	$\frac{2}{3} = \frac{4}{6}$  Cross products	Use equivalent fractions to recognize proportion  Cross products to check	1	Review equivalent fractions. Find equivalent fractions with given denominator. Use cross products to show equivalency. What is a proportion? Solve for missing value using cross products and equivalent fractions.										
Ratios and Proportional Relationships	7.RP.A.2a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>2</td><td>3</td></tr> <tr><td>6</td><td>?</td></tr> <tr><td>8</td><td>12</td></tr> <tr><td>?</td><td>20</td></tr> </table>	2	3	6	?	8	12	?	20	Use a table	1	Review proportions. Use a table to show values; determine whether they are proportional. Identify dependent and independent values in a table. Given a group of tables, determine which ones show proportional relationships. Work with a partner to share and discuss which is proportional and why, and/or which is not proportional. Make your own table to show a proportional and non-proportional relationship. Share tables and see if classmates can determine which tables are proportional.		
2	3															
6	?															
8	12															
?	20															
Ratios and Proportional Relationships	7.RP.A.2a	Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	(0,0) (2,3) (4,6) Test by graphing	Graph on a coordinate plane to determine proportion	2	Relate a table with graphing points. Use a table to graph points on a coordinate plane. Graph points—have one table that shows proportion and another that is not proportional. Make a graphic organizer that relates: Graph, Table, Equation, Verbal Scenario. List characteristics that help show whether the data is proportional or not.	Graph points or show graphs and tables to determine which show proportion. Pay attention to the scale of the graphs. Compare the graphs. What makes a graph show proportion? How does the graph help you determine if it's proportional? Take points from the graph and put them in a table to see the proportion in a table. Use a graphic organizer to help.									
Ratios and Proportional Relationships	7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	<table border="1" style="display: inline-table; vertical-align: middle;"> <tr><td>2</td><td>6</td></tr> <tr><td>3</td><td>?</td></tr> <tr><td>4</td><td>12</td></tr> </table> $\frac{y}{x} : \frac{6}{2} : \frac{12}{4} : \frac{?}{3}$ $? = 9$ $\frac{6}{2} = 3 \quad \frac{12}{4} = 3 \quad \frac{9}{3} = 3$	2	6	3	?	4	12	Find the constant of proportionality from a table or graph	2	What is the constant of proportionality? $y = kx$ Provide students with k, plug-in points for x and y, and graph the lines. What patterns do you notice? Make a table and graph. Make a graphic organizer defining Constant of Proportionality: General Equation $y = kx$ , Example $y = 3x$ , Table of Values, Graph of Equation, Visual Representation of k on the Graph (slope). General observations: always goes through (0,0), k = slope.	Solve for k. Given values for x and y, from a table or coordinates, solve for k. Real-world problem solving: Find the constant of proportionality. Cost per day Miles per hour			
2	6															
3	?															
4	12															

Domain (Unit/Category/Topic)	CCSS Code	Description of Standard	Example/Problem Types	Skills Focus	Number of Lessons	Lesson 1	Lesson 2	Lesson 3
Ratios and Proportional Relationships	7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	$y = 2x$ $y = kx$ $y$ doubles as $x$ increases	Find the constant of proportionality from equations, diagrams, and descriptions	2	$y = kx$ Solve for $x$ , $y$ , or $k$ . Find $k$ given values for $x$ and $y$ . Apply $k$ to the equation and graph or make a table from the equation. Use graphic organizer to solve all 3 ways. If you have $k$ and $x$ you can solve for $y$ , if you have $x$ and $y$ you can solve for $k$ , and if you have $y$ and $k$ you can solve for $x$ . Set up equations to solve all 3 ways.	Constant of proportionality using diagrams Circles: The circumference, $C$ , of a circle is directly proportional to the diameter, $d$ , of a circle. Find the constant of proportionality in the formula.  Volume: The volume of paint used, $V$ liters, is directly proportional to the area, $A$ square feet, that the paint can cover. 0.5 gallons of paint can cover a wall with an area of 95 square feet. A. Find the constant of proportionality. B. Write an equation relating $V$ and $A$ . C. How much paint would be needed to cover an area of 250 square feet?	
Ratios and Proportional Relationships	7.RP.A.2c	Represent proportional relationships by equations.	If total cost $t$ is proportional to the number $n$ of items purchased at a constant price $p$ , the relationship between the total cost and the number of items can be expressed as $t = pn$ .	Represent, match, or find equations using proportional relationships	2	How do you write a proportional equation from a word problem? Remember: $y = kx$ . Write equation from tables and graphs.	Write equation, make a table, and make a graph from word problems.	
Ratios and Proportional Relationships	7.RP.A.2d	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.	Label the point $(1,r)$ on the graph.	Identify and interpret the point $(1,r)$ on the graph of a proportional relationship; $r =$ unit rate  Direct variation — goes through the origin $(0,0)$  Understand that the point $(1,r)$ is also unit rate	2	Interactive graphs Double line graph showing 2 rates: Determine the constant of proportionality and also find the point $(1,r)$ on the graph. What does this point tell us? For example: Speed of 2 bike riders, graphs are $y = 4x$ and $y = 2.5x$ . Which graph is steeper? Compare $k$ for each. What is the unit rate for each bike rider?	Make double line graphs from tables to find $(1,r)$ . Answer questions about graphs and $y = kx$ .	
Ratios and Proportional Relationships	7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.	Find the final cost of item \$12.00 with 5% tax. There's a discount of 30% off. What's the discount amount? What's the final price?	Tax, discounts, commission	3	What's the tax? Review percent as a decimal and fraction, ratio. Find tax amount. Determine final cost — Use multistep equations.	<i>Coupon Clipper</i> Provide cards with various prices of items and coupons. Students "shop" by choosing their item and randomly drawing a discount. Add tax as well to find a final price at checkout. Find discount amount. Find final price by subtracting discount amount or by finding the amount paid. Example: 25% of 120 can be done by doing $0.25 \times 120$ and subtracting from 120 or taking $0.75 \times 120$ to find final cost.	<i>Car Sales and Real Estate Sales</i> What is commission? Why do we have commission? Use larger numbers to determine commission earned in various scenarios.
Ratios and Proportional Relationships	7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.	The price of eggs rose from \$2.50 to \$3.25 per dozen. What's the percent increase?  $\frac{(\text{new value} - \text{original value})}{\text{original value}} \times 100 = \text{percent of change}$ $\frac{(3.25 - 2.50)}{2.50} \times 100 = 30\% \text{ increase}$	Percent increase, decrease  Find percent increase, decrease using proportions	3	Meaning of percent of change. Discuss and describe how prices change, but sometimes the higher price does not mean it has a higher percent of change. Introduce the concept with simple comparisons: A: \$2 to \$4 or B: \$10 to \$14 Which has a higher percent of change? B went up by more dollars, but did it have a higher percent of change? Why or why not? Pay attention to why the original amount is the denominator in the equation.	Percent of change—formula and scenarios. Determine the percent of change using the formula $\frac{(\text{new value} - \text{original value})}{\text{original value}} \times 100 = \text{percent of change}$	<i>Not My Grandparent's Coffee</i> Take a look at inflation by comparing prices of items from now and from 50 years ago. Determine the percent of change.
Ratios and Proportional Relationships	7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.	$I = pr$	Simple interest	2	What is interest? Simple interest formula. Interest earned. Interest accrued. Apply the simple interest formula to determine how much interest is earned and the new balance.	<i>Credit Card Catastrophe</i> Follow these steps of a scenario: Person A: Spends \$600 on a credit card, only makes minimum payments, plus 25% interest. Calculate interest and how much they pay in the end. How many months did it take to pay off? Person B: Spends \$600 cash. Person C: Spends \$600 on a credit card and pays \$100 per month, plus 29% interest. How much did they pay in the end? How long did it take to pay it off?	
Ratios and Proportional Relationships	7.RP.A.3	Use proportional relationships to solve multistep ratio and percent problems.	$\frac{(\text{approx.} - \text{exact})}{\text{exact}} \times 100 = \% \text{ error}$	Percent error	1	Graph points or show graphs and tables to determine which ones show proportion. Pay attention to the scale of the graphs. Compare the graphs. What makes a graph show proportion? How does the graph help you determine if it's proportional? Take points from the graph and put them in a table to see the proportion in a table. Use a graphic organizer to help.		