Grade Level	Content Area	Course Title *(For 9-12 Samples Only)*	Unit Title
7th grade	Math		Computing unit rates with fractions

Length of Unit	Time of Year Taught	Expected Prior Knowledge
5 days- 60 minutes/day	2nd quarter	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.7.NS.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts. Apply properties of operations as strategies to multiply and divide rational numbers. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.

Unit Description: The unit begins reviewing ratios and comparing ratios and moves into computing rates with whole numbers. When students have mastered computing rates with whole numbers, they will move into computing rates with fractions. The teacher will model, guide and then give independent practice. The unit will be assessed with a quiz at the end to demonstrate mastery.

Standards: See instructions on page 15.	Analyze proportional relationships and use them to solve real-world and mathematical problems. 7.RP.1. Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction* $^{1/2}/_{1/4}$ *miles per hour, equivalently 2 miles per hour.*
Summative Assessment *In addition to the description, include a copy of the summative assessment in the application package.*	Students will complete a quiz to demonstrate mastery of computing unit rates.
Scoring for Summative Assessment *In addition to the description, include a copy of the answer key and scoring rubric (if applicable) for the summative assessment in the application package.*	Students will complete a five question quiz about unit rates associated with fractions. Students will demonstrate mastery by scoring a 4 out of 5 which is at least 70%. Each correct answer is worth one point.
Materials/Resources Needed *Include all items for the entire unit.*	White boards, math journal, Practice questions

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Instruction and Timeline	Objective: Students will create and understand ratios. Anticipatory Set: Review ratios (boys to girls, brown hair to blond hair) Instructional input/Modeling: Teacher will explain that a ratio is a comparison of two quantities by division. Explain a to b, a:b, a/b b does not equal 0. Guided Practice: Model writing ratios as fractions using a student survey example of students with jobs vs students without jobs. A survey asked students whether they had after school jobs. Students will write each ratio as a fraction in simplest form. Teacher will model: A. students with jobs to students without jobs. Students will complete in their journal: B. Students without jobs to all students surveys, with teacher guidance. Independent Practice: In	Objective: Compute unit rates associated with real world problems. Anticipatory Set: Write these in the simplest form in math journals: 30/35, 12/15. Instructional input/Modeling: A rate is a ratio that compares quantities in different units. A unit rate is a rate that has a denominator of one. Teacher will give examples of unit rates including unit prices, gas mileage and speed. Teacher will use overhead to demonstrate a miles per hour and unit price problem. Guided Practice: Teacher will explain: Teacher model using a table to show prices for difference sizes of the same dish detergent. Which size has the lowest unit prices? Price/Volume. Teacher will compute regular price $1.20/12 oz, and students will complete	Objective: Students will compute the unit rates and understand converting a rate. Anticipatory Set: Students will complete a problem from the previous day in their math journals. Instructional input/Modeling: Teacher explains that you can use dimensional analysis to choose conversion factors for converting rate. Use conversion factors that convert miles to feet and hours to minutes. Divide the common factors and units. Simplify. Guided Practice: On overhead teacher will model: Convert 10mi/h to feet per minute. 10mi/h=10mi/1h x 5280ft/1mi x 1h/60 min. Teacher will work out problem asking questions to check for understanding. Independent Practice: Students will complete statement in math	Objective: Students will compute unit rates associated with ratios of fractions. Anticipatory Set: Students will define unit rate on their white board. Instructional input/Modeling: Teacher will review rate is a ratio that compares quantities in different units. A unit rate is a rate that has a denominator of one. Teacher will give examples of unit rates including unit prices, gas mileage and speed that include **fractions**. Teacher will use overhead to demonstrate a miles per hour and unit price problem with fractions. Guided Practice: Teacher will explain: Teacher model using a table showing how to mix juices. ½ qt of juice concentrate and ¼ gal water and figuring out rate.	Objective: Students will demonstrate mastery of computing unit rates with ratios of fractions for quantities measured in like or different units. Anticipatory Set: Students complete a problem to review the previous days lesson. Instructional input/Modeling: Teacher will review the previous lessons and answer any questions. Independent Practice: Students will complete assessment. Closure: Review what is a rate? How do you figure them out?

	journals, students will complete the following questions: Write each ratio as a fraction in simplest form: 1. Student with jobs to all students surveyed. 2. Students without jobs to student with jobs. 3:27, 6:50, 98 homes in 100 have a TV. Closure: Review #1 from independent practice.	family and economy size. Check for understanding: Which size has the lowest unit price? Independent Practice: Students will find each unit rate with a partner in their math journals: Two liters of spring water cost $1.98, A car goes 425 miles on 12.5 gal of gas. Closure: What is the rate (of cost and MPG)?	journal: 3.5 qt/min = __ gal/hr and 12cm/s= ___m/h Closure: Review conversions from math journals.	Independent Practice: Teacher will display 5 problems on the board that use fractions. Students will copy problems into math journal. Students will practice problems. Closure: Students review practice problems.	

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Student Activities and Timeline	Students will write ratios: Review ratios (boys to girls, brown hair to blond hair) Students will write each ratio as a fraction in simplest form. Teacher will model: A. students with jobs to students without jobs. Students will complete in their journal: B. Students without jobs to all students surveys, with teacher guidance. In journals, students will complete the following questions: Write each ratio as a fraction in simplest form: 1. Student with jobs to all students surveyed. 2. Students without jobs to student with jobs. 3:27, 6:50, 98 homes in 100 have a TV. Students review #1 from independent practice.	Students will write these in the simplest form in math journals: 30/35, 12/15. Students will use a table to show prices for difference sizes of the same dish detergent. Which size has the lowest unit prices? Price/Volume. Teacher will compute regular price $1.20/12 oz, and students will complete family and economy size. Students answer: Which size has the lowest unit price? Students will find each unit rate with a partner in their math journals: Two liters of spring water cost $1.98, A car goes 425 miles on 12.5 gal of gas. Students tell a friend What is the rate?	Students will complete a problem from the previous day in their math journals. Students will convert 10mi/h to feet per minute. 10mi/h=10mi/1h x 5280ft/1mi x 1h/60 min. Teacher will work out problem asking questions to check for understanding. Students will complete statement in math journal: 3.5 qt/min = __ gal/hr and 12cm/s= ___m/h Students will review conversions from math journals.	Students will define unit rate on their white board. Students will use a table showing how to mix juices. ½ qt of juice concentrate and ¼ gal water and figuring out rate. Students will complete: 5 problems on the board that use fractions. Students will copy problems into math journal. Students will practice problems. Students review practice problems.	Students complete a problem to review the previous days lesson. Students review the previous lessons and answer any questions. Students will complete assessment. Students review what is a rate? How do you figure them out?

Name: _____ Date: _____

Quiz:

Compute each unit rate based on the information given.

1. You buy a ½ yard of fabric for $.50 (1/2 dollar). What is the unit rate?

2. You mix a ½ quart of juice with a ¼ gallon of water. What is the unit rate?

3. If you sell 4 eggs out of one dozen for $.80 (4/5 dollar) What is the unit rate per dozen?

4. If a person walks ¼ mile in each ½ hour , how fast is he walking? (compute the unit rate)

5. If a person runs 1/4 mile in 1/6 of an hour. How fast is she running? (compute the unit rate)

Name: _____ Date: _____

Quiz (Answer Key):

Compute each unit rate based on the information given.

1. You buy a ½ yard of fabric for $.50 (1/2 dollar). What is the unit rate?

½ or ½ x 2 = 1 yard is 1 dollar

2. You mix a ½ quart of juice with a ¼ gallon of water. What is the unit rate?

½ qt x 4= 2 quarts per gallon

3. If you sell 4 eggs out of one dozen for $.80 (4/5 dollar) What is the unit rate per dozen?

4/5 x 36/12= 144/60= 12/5 (or $2.40 per dozen)

4. If a person walks ¼ mile in each ½ hour , how fast is he walking? (compute the unit rate)

¼ x 2/1= ½ mile per hour

5. If a person runs 1/4 mile in 1/6 of an hour. How fast is she running? (compute the unit rate)

¼ x 6/1= 6/4 or 1.5 miles per hour

Rubric
Score: _____/5
Each question correct answer is worth one point. 4 out of 5 points is the minimum needed for mastery.

Number correct:	Percent:	
0-2	0% -49%	Falls Far Below
3	50%-69%	Approaches
4-5	70%-100%	Meets Mastery Level