Grade Level	Content Area	Course Title *(9-12 Samples Only)*	Unit Title
7	**Math**	**N/A**	**Calculating Unit Rates using Ratios**

Length of Unit	Time of Year Taught	Expected Prior Knowledge
4 days	**5th week**	Multiplying and dividing fractions; understanding ratios and the relationships they represent

Unit Description

Students will learn how to use ratios to solve unit rates, including ones involving complex fractions and quantities measured in the same and different units.

Standards: See instructions on page 15.	**Domain: Ratios and Proportional Relationships** **Cluster: Analyze proportional relationships and use them to solve real-world and mathematical problems.** **Standard: 1** 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.*	At the end of the unit, students will take a 15-question quiz to gauge their mastery of the standard.
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.*	#'s 1-5 are worth 1 point each #'s 5-15 are worth 2 points each Total possible points: 25 The total points earned will be divided by 25 to determine a percentage and thereby an A-F grade. C- or lower is considered not meeting the standard; C through B- is approaching; B or better is meeting the standard.
Materials/Resources Needed *Include all items for the entire unit.*	Textbooks (student and teacher edition), white board, white board markers, reteaching/review workbooks for generating additional practice resources, paper, and pencils.

	Lesson 1	Lesson 2	Lesson 3	Lesson 4
Instruction and Timeline	Brainstorm different units of measure with students (i.e. miles per hour). Represent those units of measure as ratios and remind students what ratios are and how they are written. Provide several examples of ratios, including boys to girls in class, students to teacher, etc. [20 minutes]. Review how to multiply and divide fractions and apply that practice to unit rates measuring length, for example. [25 minutes]. After students complete independent work, teacher assigns problems from the textbook for homework and explains his/her expectations. [5 minutes]	Teacher shows students how to convert between several units of measure (i.e. inches to feet) and how to solve unit rate problems after making those conversions [30 minutes]. Teacher assigns problems from the textbook for homework and explains his/her expectations. [5 minutes].	Teacher will review identification of ratios and how to calculate missing parts of ratios, including areas, times, and lengths. [30 minutes]. Teacher will demonstrate outside of the school building how to calculate the height of the school building by using students' own height, students' shadow length, and the shadow length of the building. [20 minutes]. Teacher assigns word problems worksheets on unit rates for homework and discusses what resources students should refer to for help doing the homework. [5 minutes].	Teacher reviews how to solve unit rate problems involving fractions. [20 minutes]. After the review game, teacher discusses how to best prepare for tomorrow's quiz. [5 minutes].

	Lesson 1	Lesson 2	Lesson 3	Lesson 4
Student Activities and Timeline	Students complete a worksheet reviewing ratios and identifying unit rates and review answers with teacher. [15 minutes]. Students complete problems in the textbook that require them to compute unit rates [25 minutes].	Students attempt to solve a Challenge of the Day problem on unit rates. [5 minutes]. Students go over homework with teacher and some students show on the board how they solved the homework problems. [10 minutes]. Students do Guided Practice with teacher converting between units of measure (i.e. inches to feet). [10 minutes.] Students then work independently on problems of the same nature as the Guided Practice, while the teacher circulates the room. [30 minutes].	Students review homework with teacher, with difficult problems being shown on the board. [10 minutes]. Students work with a partner solving problems that require calculating missing parts of ratios, including areas, times, and lengths. [25 minutes].	Students complete a review worksheet on multiplying and dividing fractions and review the answers with a partner. [10 minutes]. Students review homework with teacher. [10 minutes] Students complete independent work on solving unit rate problems involving fractions, while the teacher circulates the room helping students who have questions. [25 minutes]. Students play a math review game to prepare for tomorrow's assessment. [20 minutes]

Ratios and Unit Rates Quiz: 7th Grade

1. There are 5 girls and 8 boys on a team. What is the ratio of boys to girls on the team?

2. Write as a ratio in lowest terms: 8 pies to 12 cakes.

3. Find the unit rate of 300 calories for 5 hours.

4. Find the unit rate of $20.88 for 9 gal.

5. Write the ratio in fraction form. Then find the unit rate for:
54 revolutions in 12 minutes

6. If John runs ½ of a mile in 1/15 of an hour, calculate his speed per hour.

7. After his race, John drinks 2/3 of a liter of water in 1/3 of a minute. Compute his unit rate.

8. If Donna hikes 9/10 of a kilometer in ¼ of an hour, calculate her hiking speed.

9. A painter has to drive 15 miles across town to his next painting job. If he drives at an average speed of 30 miles per hour, about how long will it take him to get there?

10. Hailey spends $3.52 for a 1-lb jar of olives. Sonny spends $3.78 for an 18-oz jar of olives. Who got the better deal? (You must show your work in order to get credit for your answer.)

11. Three windows have 24 panes. How many of the same windows would have 96 panes?

12. Quinn gets 54 pencils after buying 3 pencil packs. How many pencils would Quinn have if she bought 9 packs?

13. A basket holds only peppers and ears of corn. If the ratio of peppers to corn is 7 to 5, what is the ratio of peppers to vegetables in the basket?

14. Write the rate in fraction form. Then find the value of x. Then calculate his unit rate per hour.

James can solve 18 fraction problems in 3 minutes, so he can solve x fraction problems in 1 minute. How many can he solve per hour?

15. Larry is on a train that is moving 60 miles per hour. How far will he travel in 4.5 hours?

Ratios and Unit Rates Quiz: 7th Grade
Answer Key

#'s 1-5 are worth 1 point each
#'s 5-15 are worth 2 points each

Total possible points: 25

1. 8/5 or 8:5 or 8 to 5

2. 2/3 or 2:3 or 2 to 3

3. 60 calories per hour

4. $2.32 per gallon

5. 54/12 or 9/2: 4.5 revolutions per minute

6. 7.5 miles per hour

7. 2 liters per minute

8. 3.6 kilometers per hour

9. ½ hour

10. Sonny got the better deal because $0.21 per oz < $0.22 per oz

11. 12 windows

12. 162 pencils

13. 7 to 12

14. 18/3; x=6; 360 problems in one hour

15. 270 miles