Grade Level	Content Area	Course Title *(9-12 Samples Only)*	Unit Title
6	**Math**	**N/A**	**Ratios & Ratio Reasoning**

Length of Unit	Time of Year Taught	Expected Prior Knowledge
5 days	**Week 15**	Understanding and identifying equivalent fractions

Unit Description

Students will be taught what ratios are and what they represent: relationships that are part-to-part, part-to-whole, and whole-to-part; they will learn how to write ratios, what equivalent ratios are and how to compute them, and how to solve word problems using ratios.

Standards: See instructions on page 15.	Domain: Ratios and Proportional Relationships Cluster: Understand ratio concepts and use ratio reasoning to solve problems. Standard: #1 Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."
Summative Assessment *In addition to the description, include a copy of the summative assessment in the application package.*	An end-of-unit quiz will be given to assess understanding of the standard taught. It will be 16 questions and includes direct computation, true/false questions, and word problems.
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.*	#1-4 are 2 pts each #5-8 are 3 pts each #9-13 are 2 pts each #14-17 are 2 pts each Total of 38 possible points: Any score below 28 points will be seen as not meeting the standard. 29-31 Points is approaching; 32-38 points is mastery of the standard Points earned out of 38 will be converted to a percentage to figure out an A-F grade
Materials/Resources Needed *Include all items for the entire unit.*	**Textbooks (teacher and student editions), student workbooks, paper, pencils, overhead projector, transparencies, counters, assessment guide TE**

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Instruction and Timeline	After warm-up (see Student Activities below), the teacher will spend about 30 minutes demonstrating the following concepts: Ratios compare numbers; ratios can compare a part to a part, a part to a whole, or a whole to a part; there are 3 ways that a ratio can be written; equivalent ratios, like equivalent fractions, can be found by multiplying or dividing both terms by a common factor. The teacher will write several examples on the board and will call on students to give answers, ask questions, and write answers on the board. The teacher	Teacher reviews homework with students for about 10 minutes after Challenge of the Day (see below). The teacher reviews the concepts from yesterday's lesson through examples and direct instruction for about 10 minutes. During independent classwork (see below), the teacher works with a small group of students struggling with the material. Teacher discusses with class for 10 minutes, while using examples, that you must write the parts of a ratio in the correct order (i.e. the ratio of stars to stripes on the American flag is 50	Teacher reviews homework with students (10 minutes). While students work in partners on word problems (see below), the teacher quickly sorts the corrected pop quizzes into 3 piles: struggling, meeting, exceeding. After reviewing the answers to the word problems for 10 minutes, the teacher breaks the class into 3 groups (according to performance as noted above) and assigns each group its classwork. He/She works with each group and then rotates. (About 25 minutes total). He/she will use a visual approach with manipulatives	After the warm-up and collecting of homework (see below), the teacher does a lesson using Semantic Mapping for terms such as "equivalent ratios." (10 minutes). Teacher discusses the parameters with students of how to design their own "quiz" for another student to take (not for a grade, just for learning purposes); each "quiz" must, for example, have 3 questions about equivalent ratios and include an answer key. (10 minutes discussing instructions and giving examples). After students create and take each other's "quizzes" (see below), the	Teacher and students review last night's homework and go over any questions that students have. (10 minutes). After the summative assessment has been completed, the teacher will begin teaching the next concept through direct instruction: Understanding Unit Rate Problem Solving (40 minutes).

	will also use counters of varied colors on the overhead projector to represent parts of a ratio. After Independent Practice (see below), the teacher will go over the answers with students. Students will be asked to provide answers and/or to show on the board how they got those answers. For the last 5 minutes of class, the homework assignment (problems from the textbook) will be discussed and teacher will express his/her expectations for the homework.	to 13 and cannot be expressed as 13 to 50). For the last 10 minutes of class, the teacher reviews the homework assignment and closes the lesson with questions like: If one bird has two wings, what is the ratio of birds to wings? What are 3 ways to write that ratio? How could I express the ratio of birds to wings if there were 4 birds?	for the struggling group.	teacher discusses tomorrow's summative assessment and provides review worksheets for tonight's homework assignment that will help students to prepare. (10 minutes)	

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Student Activities and Timeline	1st 15 minutes of class: Students will complete a Quick Review (shown on overhead transparency) that asks them to identify whether two fractions are equivalent and to put fractions in simplest form. The answers will be discussed once students are finished. After the teacher gives examples and explains concepts (see Instruction above), students will work with teacher doing a Guided Practice for about 10 minutes. For the next 20 minutes, students will complete Independent Practice problems at their desks, while the teacher circulates through the room.	1st 5 minutes of class: Students attempt to solve a Challenge of the Day. The answer is discussed with a partner and then whole class. After reviewing homework and reviewing concepts (see above), students independently complete problems in their Student Workbooks for about 25 minutes. In groups of three, students correct their classwork together for 10 minutes. Students complete a Check for Understanding worksheet with problems similar to the American flag one mentioned above. (10 minutes).	After reviewing homework, students complete a Review worksheet summing up concepts introduced during Lessons 1-2; then students and teacher review the answers together. (15 minutes). Students take a pop quiz for 10 minutes that checks for understanding of the lessons reviewed thus far. Students grade each other's pop quizzes for 10 minutes with the aid of the teacher. Students (in partners) attempt to solve ratio questions for 10 minutes that incorporate word problems that use, for example, 3 parts in a ratio, not just 2, and other more	Students do a Warm-Up exercise from a transparency that asks for ratios to be written in 3 ways, for rations to be expressed in simplest form, etc. (10 minutes). Warm-Up answers are discussed on the board by students (10 minutes). Students create a "quiz" for another student to take (see above); another student takes the "quiz" and vice versa and the two go over the answers together afterwards. (40 minutes total)	Students review their homework with teacher and ask any questions before taking the summative assessment. (10 minutes). Students take the summative assessment. (20 minutes). After the summative assessment and teacher's instruction on unit rates, students will complete Guided and Independent Practice on unit rate problem solving. (20 minutes)

			challenging applications of ratio relationships. Students work in groups on a ratio assignment tailored to their level of understanding (see above).		

Note that 6th grade daily math instruction generally lasts for 120 minutes. These lessons are designed for 90 minutes of instructional time so that 30 minutes could be spent each day on another math standard and concept.

Ratios & Ratio Reasoning Quiz: 6th Grade

Circle True or False:

1. A ratio is a comparison of two numbers. True False

2. The ratio of stars to stripes in the American flag can be written as 50:13 and 13:50. True False

3. Equivalent ratios name the same comparison. True False

4. All ratios express parts to a whole. True False

Write each ratio three ways:

5. $4 for 1 ticket

6. 9 hours for four movies

7. 25 plates in 5 boxes

8. 135 feet in 45 steps

Write 2 equivalent ratios in fraction form:

9. 10:6

10. 12 to 24

11. 9:45

12. 16 to 18

13. 5 to 12

Solve.

Farmer Jones has a 500-acre piece of land. He knows that each acre of land can support 25 cows or 8 horses.

14. What is the ratio of cows to land in simplest form?

15. What is the ratio of horses to land in simplest form?

16. How many horses can live on 2 acres?

17. If you had 100 acres for cows, how many cows could you buy?

Answer Key
Ratios & Ratio Reasoning Quiz: 6th Grade

#1-4 are 2 pts each
#5-8 are 3 pts each
#9-13 are 2 pts each
#14-17 are 2 pts each

Total of 38 possible points

1. True

2. False

3. True

4. False

5. 4 to 1; 4/1; 4:1

6. 9 to 4; 9/4; 9:4

7. 25 to 5; 25/5; 25:5 (could also be written in simplest form)

8. 135 to 45; 135/45; 135:45 (could also be written in simplest form)

9. Examples: 5/3 and 20/12

10. Examples: ½ and 24/48

11. Examples: 1/5 and 18/90

12. Examples: 8/9 and 32/38

13. Examples: 10/24 and 15/36

14. 25:1

15. 8:1

16. 16 horses

17. 2,500 cows