Grade Level	Content Area	Course Title *(For 9-12 Samples Only)*	Unit Title
6th grade	Mathematics		Expressing Ratios

Length of Unit	Time of Year Taught	Expected Prior Knowledge
5 days 60 minutes per day	1st quarter	Ratios and Proportions Compute fluently with multi digit numbers and find common factors and multiples: 6.NS.2. Fluently divide multi-digit numbers using the standard algorithm.6.NS.3. Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation

Unit Description: The unit begins with the teacher explain expressing ratios using real life classroom examples. The teacher guides and the students practice ratios. The lessons focus on the three ways to express a ratio, and one of the lessons focuses on the order of ratios. The students write their own ratios and create their own ratio using peanut butter and jelly. The assessment is a 5 question quiz where the students are asked to express ratios in the three formats.

Standards: See instructions on page 15.	Ratios and Proportions: Understand ratio concepts and use ratio reasoning to solve problems. 6-1. 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.*	The students will be assessed using a five question quiz. The students will write a ratio in the three formats in the correct order.
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 5 question quiz and each question has 3 parts. Each part of each question is worth one point. Students will demonstrate mastery by scoring an 11 out of 15 which is at least a 70%.
Materials/Resources Needed *Include all items for the entire unit.*	Students white boards, peanut butter and jelly (one container per group), measuring spoons or cups, butter knives, paper towels, damp sponges, teacher developed graphs, assessment

	Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
Instruction and Timeline	Objective: Students will understand what a ratio is	Objective: Students will demonstrate	Objective: Students will create ratios and solve.	Objective: Students will create ratios with peanut	Objective: Student will demonstrate mastery of

	and three ways to express them. Anticipatory set: What is a ratio? A comparison of two numbers or quantities. Instructional Input/Modeling: Explain ratios with an example: someone can look at a group of people, count noses, and refer to the "ratio of men to women" in the group. Suppose there are thirty-five people, fifteen of whom are men. Then the ratio of men to women is 15 to 20. Explain that there are 3 ways to express them: 1.)Expressing the ratio in words: "15 to 20" 2.) odds notation: 15 **:** 20 and 3.) fractional notation: $^{15}/_{20}$ Check for Understanding: Write on your white board 3 ways to express the ratio of men to women. Guided Practice: Teacher will randomly select 10 students to come forward. Divide the students into groups by sex. Have seated learners count the	understanding of the order of ratios. Anticipatory set: What is the ratio of boys to girls in class today? What is the ratio of girls to boys? Instructional Input/modeling: Review the previous day. Go over the 3 ways to express ratios. Explain to students that they need to be careful about ratios. Order matters! Refer to the anticipatory set and discuss how the ratio of girls to boys and boys to girls is different. Guided Practice: Use one of the examples from the previous day: students who brought lunch vs buying. Check for Understanding: Have students write on their white board the ratio of students bringing lunch vs buying and buying vs bringing. Independent Practice:	Anticipatory set: What is the ratio of wings to beaks at the bird house in the zoo? Why? Instructional Input: Teacher will review all the questions from the previous day. Review ratios and ways to express them. Check for Understanding: What are the 3 ways to express ratios? Guided Practice: Teacher will model making up a simple ratio. Have students create 3 of their own ratios in their math journal independently. Independent Practice: Students get with a partner and solve each other's problems using the 3 ways to express a ratio and making sure to get it in the right order. Closure: How can changing the order of a ratio change what it means? Review some examples from students.	butter and jelly. Anticipatory Set: What is the best ratio of peanut butter to jelly in a sandwich? Instructional Input: Divide class into groups. Direct each group to make a series of six peanut butter and jelly sandwiches, each containing a different ratio of the given spreads. Students are to label each ratio. Cut each sandwich into pieces. (Have alternate opportunity if peanut allergies exist) Guided Practice: Conduct a taste test of the preferred ratio. Have each student within the group taste each sandwich and rate it on a scale of one to six. Independent Practice: Direct students to and report the results of the trial individually. Have each group share their favorite ratio with the rest of the class. Compare and contrast	using ratios to describe the relationship between two quantities. Anticipatory Set: What is your favorite ratio of peanut butter to jelly based on yesterday's lab? Instructional input: Teacher will review ratios and explain directions. Students complete assessment. Closure: Collect assessment. Review a problem from quiz.

	number of boys and girls. Explain that this expression identifies the ratio of boys to girls called forward. The teacher will physically structure the following examples (ex: students by hair color, students who brought lunch vs buying, students that write with pens to those that use pencils.) Independent Practice: Students will write down the ratio in their math journals. Closure: Review answers to ratios demonstrated.	Give students the following practice questions to complete in their journal in the 3 ratio formats: 1.) There are 4 triangles and 7 squares What is the ratio of triangles to squares and squares to triangles? 2.) There are 40 cats and 56 dogs at the shelter. What is the ratio of cats to dogs and dogs to cats? 3.) There are 10 pencils in this package. Write the ratio of packages to pencils and pencils to packages. Teacher walks around room and helps as necessary. Closure: What are the three ways to write the ratio for cats to dogs?		differences. Closure: What are some other that we could use for a ratio study instead of peanut butter and jelly (ex: lemons to sugar to water, red to white paint to create the most desirable shade of pink...)	

	Lesson 1	**Lesson 2**	**Lesson 3**	**Lesson 4**	**Lesson 5**
Student Activities	Students discuss: What is a ratio? A	Students write the 3 ways	Students complete the question: what is the	Students discuss what is the best ratio of peanut butter to	Students answer: what is your favorite

and Timeline	comparison of two numbers or quantities. Students will write on your white board 3 ways to express the ratio of men to women. Students come forward. Divide the students into groups by sex. Have seated learners count the number of boys and girls. Students will write down the ratio in their math journals. Students review answers to ratios demonstrated.	to express ratios. Students review the from the previous day: students who brought lunch vs buying and order of ratios. Have students write on their white board the ratio of students bringing lunch vs buying and buying vs bringing. Students complete following practice questions to complete in their journal in the 3 ratio formats: 1.) There are 4 triangles and 7 squares What is the ratio of triangles to squares and squares to triangles? 2.) There are 40 cats and 56 dogs at the shelter. What is the ratio of cats to dogs and dogs to cats? 3.) There are 10 pencils in this package. Write the ratio of packages to pencils and pencils to packages. Students answer: What are the three ways to write the ratio for cats to dogs?	ratio of wings to beaks at the bird house in the zoo? Why? Students review all the questions from the previous day. Students write what are the 3 ways to express ratios? Students create 3 of their own ratios in their math journal independently. Students get with a partner and solve each other's problems using the 3 ways to express a ratio and making sure to get it in the right order. Students answer: How can changing the order of a ratio change what it means? Review some examples from students.	jelly in a sandwich? Students are divided into groups. each group makes a series of six peanut butter and jelly sandwiches, each containing a different ratio of the given spreads. Students label each ratio. Cut each sandwich into pieces. Students conduct a taste test of the preferred ratio. Have each student within the group taste each sandwich and rate it on a scale of one to six. Students report the results of the trial individually. Have each group share their favorite ratio with the rest of the class. Compare and contrast differences. Students answer: What are some other that we could use for a ratio study instead of peanut butter and jelly (ex: lemons to sugar to water, red to white paint to create the most desirable shade of pink...)	ratio of peanut butter to jelly based on yesterday's lab? Students complete assessment. Students review a problem from quiz.

Name: _____
Date: _____

Ratio Quiz:
Directions: Express each question in all three formats.

Answer Key

1. There are 16 ducks and 9 geese in a certain park. Express the ratio of ducks to geese..

2. There are 16 ducks and 9 geese in a certain park. Express the ratio of geese to ducks.

3. In a certain class, 18 students are passing and 2 students are failing. Express the ratio of failing grades to passing grades.

4. In a certain class, 18 students are passing and 2 students are failing. Express the ratio of passing grades to failing grades.

5. In a given month, there are 20 sunny days and 10 cloudy days. Express the ratio of cloudy days to sunny days.

Name: _____
Date: _____

Ratio Quiz:
Directions: Express each question in all three formats.

Answer Key

1. There are 16 ducks and 9 geese in a certain park. Express the ratio of ducks to geese in all three formats.

   16: 9, 16/9, 16 to 9.

2. There are 16 ducks and 9 geese in a certain park. Express the ratio of geese to ducks in all three formats.

   9:16, 9/16, 9 to 16

3. In a certain class, 18 students are passing and 2 students are failing. Express the ratio of failing grades to passing grades.

   2: 18, 2/18, 2 to 18

4. In a certain class, 18 students are passing and 2 students are failing. Express the ratio of passing grades to failing grades.

   18:2, 18/2, 18 to 2

5. In a given month, there are 20 sunny days and 10 cloudy days. Express the ratio of cloudy days to sunny days.

   10:20, 10/20, 10 to 20

Score: _____/15
Each question has three answers and each answer is worth one point. 11 out of 15 points is the minimum needed for mastery.

Number correct:	Percent:	
0-7	0% -49%	Falls Far Below
8-10	50%-69%	Approaches
11-15	70%-100%	Meets Mastery Level