Grade: 5 Subject: Mathematics	Unit 9: Multiplication and Division with Fractions
Big Idea/Rationale	• In this unit students being working with unit fractions to help them lay the groundwork for multiplying and dividing with any fractions. They work on activities using fraction bars and number line to help build links between multiplication and addition and between multiplication and division. Students also develop algorithms for multiplying and dividing fractions. Students have opportunities to apply their understanding of multiplying and dividing fractions in real-life, problem-solving situations
Enduring Understanding (Mastery Objective)	Students will understand that: • A unit square can be used to show the area meaning of fraction multiplication. When you multiply two fractions that are less than 1, the product is smaller than either fraction. • Multiplying a whole number by a fraction involves division as well as multiplication. The product is a fraction of the whole number. • There is an inverse relationship between dividing fractions and multiplication
Essential Questions (Instructional Objective)	• How do you multiply fractions and mixed numbers? • How is multiplying fractions related to division? • How is dividing fractions related to multiplication?
Content (Subject Matter)	• Demonstrate understanding that multiplying by a unit fraction $1/n$ is the same as dividing by the whole number n. • Express multiplicative comparisons in two ways. • Multiply a whole number by a unit fraction to produce a whole number. • Multiply a whole number by a non-unit fraction to produce a whole number. • Relate multiplication by a unit fraction, a non-unit fraction and a whole number. • Demonstrate understanding that a whole number (w) taken a fractional number of times is the same as a fraction taken w times. • Multiply a whole number by a fraction to produce a fraction. • Explore how to take a fraction of a fraction. • Multiply any two fractions together. • Simplify multiplication equations with fractions before solving. • Recognize situations requiring a subset of a subset. • Predict the results of adding, subtracting and multiplying fractions. • Solve word problems with fractions and mixed operations. • Convert common fractions (halves, fourths, eighths, thirds, sixths and fifths) to decimal numbers. • Divide a whole number by a whole number to produce a fraction. • Recognize that dividing a whole number w by a unit fraction 1/d give the

	same result as w x d.
	• Recognize that dividing a unit fraction 1/d by a whole number w give the same result as 1/(d x w).
	• Add, subtract, compare and multiply fractions.
	• Solve word problem with fractions and mixed operations.
	• Recognize the inverse relationship between multiplication and division and apply it to fractional amounts.
	• Divide a fraction or mixed number by another fraction with the visual support of number lines.
	• Divide a fraction by another fraction with no visual aids.
	• Unsimplify to divide fractions that are not evenly divisible.
	• Recognize that all division questions can be solved by inverting the dividing factor or multiplying.
	• Plan and conduct a systematic investigation to verify a method.
	• Estimate the answer to a multiplication or division question.
	• Recognize whether the answer to a multiplication or division question will be greater or less than the original number.
	• Assess everyday situations with fraction to see if they call for multiplication or division.
	• Multiply fractional side lengths to find areas of a rectangle.
	• Articulate the significant differences between adding, subtracting, multiplying and dividing fractions.
	• Determine whether to solve a world problem using addition, subtraction, multiplication or division and then carry out the operation.
	• Find the mean of a data set made up of fractions or decimals.
	• Solve a variety of problems using mathematical concepts and skills.
	• Solve a variety of problems using mathematical concepts and skills.
Skills/ Benchmarks (CCSS Standards)	• **5.NF.B.3**: Interpret a fraction as division of the numerator by the denominator (a/b = a divided by b). Solve word problems involving division of whole numbers leading to answers I the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
	• **5.NF.B.4:** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
	• **5.NF.B.4.A**: Interpret a product (a/b) x q as a parts of a partition of q into b equal parts, equivalently, as the result of a sequence of operations (a x q)/b
	• **5.NF.B.4.B:** Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
	• **5.NF.B.5:** Interpret multiplication as scaling (resizing), by:
	• **5.NF.B.5.A:** Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated

	multiplication
	• **5.NF.B.5.B:** Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (nxa)/(nxb)$ to the effect of multiplying a/b by 1.
	• **5.NF.B.6:** Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations represent the problem.
	• **5.NF.B.7:** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
	• **5.NF.B.7.A**: Interpret division of unit fraction by a non-zero whole number, and compute such quotients.
	• **5.NF.B.7.B:** Interpret division of a whole number by a unit fraction, and compute such quotients.
	• **5.NF.C.7.C:** Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g. by using visual fraction models and equations to represent the problem.
	• **Mathematical Practices**
Materials and Resources	• Math Expressions, Student Journals, Manipulatives, Math themed literature, BrainPop, IXL Mathematics