Mathematics – Fifth Grade

	Operations and Algebraic Thinking	Number and Operations in Base Ten	Numbers and Operations - Fractions	Measurement and Data	Geometry
CCSS Cluster Statement	Write and interpret numerical expressions.	Understand the place value system.	Use equivalent fractions as a strategy to add and subtract fractions.	Convert like measurement units within a given measurement systems.	Graph points on the coordinate plane to solve real-world and mathematical problems.
CCSS Standard	1. Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.	1. Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.	1. Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. *For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)*	1. Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.	1. Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., *x*-axis and *x*-coordinate, *y*-axis and *y*-coordinate).
Learning Target	I can use parentheses, brackets, or braces to group an expression within a multi-step numerical expression.	I can recognize that each place to the left is 10 times larger in a multi-digit number. I can recognize that each place to the right is 1/10 as much in a multi-digit number.	I can determine common multiples of unlike denominators. I can create equivalent fractions using common multiples. I can add and subtract fractions with unlike denominators (including mixed numbers) using equivalent fractions.	I can change measurement units within the same measurement system. I can solve multi-step word problems using measurement conversions.	I can construct a coordinate system with two intersecting perpendicular lines, label the intersection as the origin and know it is the point where 0 lies on each of the lines. I can label the X and Y axis correctly. I can identify an ordered pair as an x-coordinate followed by a y-coordinate.

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Mathematical Practices	1.Make sense of problems and persevere in solving them. 5. Use appropriate tools strategically. 8. Look for and express regularity in repeated reasoning.	8. Look for and express regularity in repeated reasoning.	7. Look for and make use of structure.	6. Attend to precision.	7. Look for and make use of structure.
MP Learning Targets	I can explain how to calculate numerical expressions with parentheses, brackets, or braces.	I can explain how a digit's position can affect its value.	I can explain how to find common multiples of unlike denominators. I can explain how to create equivalent fractions using common multiples.	I can explain how to change measurement units within the same measurement system.	I can explain the relationship between the ordered pair and the location on the coordinate plane.

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CCSS Cluster Statement	Write and interpret numerical expressions.	Understand the place value system.	Use equivalent fractions as a strategy to add and subtract fractions.	Convert like measurement units within a given measurement systems.	Graph points on the coordinate plane to solve real-world and mathematical problems.
CCSS Standard	2. Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*	2. Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.	2. Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. *For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.*		2. Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.
Learning Target	I can represent a calculation expressed verbally with a numerical expression. I can analyze expressions without solving.	I can express powers of 10 using whole number exponents. I can illustrate a pattern for how the number of zeros of a product when multiplying a whole number by a power of 10 relates to the power of 10.	I can solve addition and subtraction word problems involving fractions using visual models or equations. I can use estimation strategies, benchmark fractions and number sense to check if my answer is reasonable.		I can determine when a mathematical problem has a set of ordered pairs. I can graph points in the first quadrant of a coordinate plane using a set of ordered pairs. I can relate the coordinate values of any graphed point to the problem.
Mathematical Practices	1. Make sense of Problems and persevere in solving them. 2. Reason abstractly and quantitatively. 7. Look for and make use of structure.	8. Look for and express regularity in repeated reasoning.	4. Model with mathematics.		1. Make sense of problems and persevere in solving them.
MP Learning Targets	I can explain how to generate an expression from a calculation expressed verbally.	I can explain how a digit's position affects its value.	I can explain how to add and subtract fractions using visual models or benchmark fractions.		I can explain how to graph points in the first quadrant using a set of ordered pairs.

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CCSS Cluster Statement	Write and interpret numerical expressions.	Understand the place value system.	Use equivalent fractions as a strategy to add and subtract fractions.	Convert like measurement units within a given measurement systems.	Graph points on the coordinate plane to solve real-world and mathematical problems.
CCSS Standard		3. Read, write, and compare decimals to thousandths. a. Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000). b. Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.			
Learning Target		I can read and write decimals to the thousandths in words, base ten, and expanded form. I can compare two decimals to the thousandths using place value and record the comparison using symbols			
Mathematical Practices		3. Construct viable arguments and critique the reasoning of others.			
MP Learning Targets		I can decide with a partner how to compare two decimals using place value.			

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CCSS Standard		Use place value understanding to round decimals to any place.			
Learning Target		I can explain how to use place value and what digits to look at to round decimals to any place. I can use the value of the digit to the right of the place to be rounded to determine whether to round up or down. I can round decimals to any place.			
Mathematical Practices		6. Attend to precision.			
MP Learning Targets		I can explain how to round decimals to any place.			

	Operations and Algebraic Thinking	Number and Operations in Base Ten	Numbers and Operations - Fractions	Measurement and Data	Geometry
CCSS Cluster Statement	Analyze patterns and relationships	Perform operations with multi-digit whole numbers and with decimals to hundredths.	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Represent and interpret data.	Classify two-dimensional figures into categories based on their properties.
CCSS Standard	3. Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*	5. Fluently multiply multi-digit whole numbers using the standard algorithm.	3. Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. *For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?*	2. Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. *For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.*	3. Understand that attributes belonging to a category of two dimensional figures also belong to all subcategories of that category. *For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.*
Learning Target	I can generate two numerical patterns with the same starting number for two given rules. I can form ordered pairs out of corresponding terms for each pattern and graph them on a coordinate plane.	I can use the standard algorithm to multiply multi-digit whole numbers with ease.	I can solve word problems involving the division of whole numbers and interpret the quotient-which could be a whole number, mixed number, or fraction-in the context of the problem.	I can create a line plot with a given set of unit fraction measurements. I can solve problems using data on line plots.	I can classify two-dimensional figures by their attributes. I can identify subcategories using two-dimensional figures.

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Mathematical Practices	2. Reason abstractly and quantitatively. 7. Look for and make use of structure.	6. Attend to precision.	2. Reason abstractly and quantitatively.	6. Attend to precision.	7. Look for and make use of structure.
MP Learning Targets	I explain how to graph ordered pairs on a coordinate plane. I can explain the relationship between two number patterns by comparing how each patterns grows or by comparing the relationship between each of the corresponding terms for each pattern.	I can explain the standard algorithm for multi-digit whole number multiplication.	I can explain that fractions can be represented as a division of the numerator by the denominator and illustrate why a % b can be represented by the fraction a/b. I can explain or illustrate my solution strategy using visual fraction models or equations that represent the problem.	I can explain how to create a line plot with a given set of unit fraction measurements.	I can explain how two-dimensional attributes can belong to several two-dimensional figures.

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CCSS Standard		6. Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; quivalently, as the result of a sequence of operations $a \times q \div b$. *For example, use a visual fraction model to show* $(2/3) \times 4 = 8/3$, *and create a story context for this equation. Do the same with* $(2/3) \times (4/5) = 8/15$. *(In general,* $(a/b) \times (c/d) = ac/bd$.*)*		4. Classify two-dimensional figures in a hierarchy based on properties.
Learning Target		I can demonstrate division of whole numbers with four-digit dividends and two-digit divisors using place value, rectangular arrays, area model, and other strategies. I can solve division of whole numbers with four-digit dividends and two-digit divisors using properties of operations and equations.	I can create story contexts for problems involving multiplication of a fraction and a whole number or multiplication of two fractions by interpreting multiplication with fractions in the same way that I would interpret multiplication with whole numbers. I can use unit fraction squares to prove the area of rectangles with fractional side lengths. I can determine the area of rectangles with fractional side lengths by multiplying the side lengths.		I can group together all shapes that share a single property, and then among these shapes, group together those that share a second property, and then among these, group together those that share a third property, etc.

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Mathematical Practices		1. Make sense of problems and persevere in solving them.	4. Model with mathematics.		3. Construct viable arguments and critique the reasoning of others.
MP Learning Targets		I can explain my chosen strategy when dividing whole numbers by whole numbers.	I can explain why (a/b) x q= (a x q) / b by using visual models to show that q is partitioned into b equal parts.		I can explain how to group or classify shapes based on properties.

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CCSS Cluster Statement	Analyze patterns and relationships	Perform operations with multi-digit whole numbers and with decimals to hundredths.	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Represent and interpret data.	Classify two-dimensional figures into categories based on their properties.
CCSS Standard		7. Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.	4. Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. 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.		
Learning Target		I can add, subtract, multiply, and divide decimals to hundredths using strategies based on place value, properties of operations, or other strategies.	I can create story contexts for problems involving multiplication of a fraction and a whole number or multiplication of two fractions by interpreting multiplication with fractions in the same way that I would interpret multiplication with whole numbers. I can use unit fraction squares to prove the area of rectangles with fractional side lengths. I can determine the area of rectangles with fractional side lengths by multiplying the side lengths.		

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Mathematical Practices		3. Construct viable arguments and critique the reasoning of others.	4. Model with mathematics.		
MP Learning Targets		I can explain and illustrate strategies using concrete models or drawings how to add, subtract, multiply, and divid decimals to hundredths.	I can explain why (a/b) x q= (a x q) / b by using visual models to show that q is partitioned into be equal parts.		

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CCSS Standard			5. Interpret multiplication as scaling (resizing), by: 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. 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 $a/b = (n\times a)/(n\times b)$ to the effect of multiplying a/b by 1.		
Learning Target			I can interpret the relationship between the size of the factors to the size of the product. I can multiply a given fraction by 1 to find an equivalent fraction.		
Mathematical Practices			7. Look for and make use of structure.		
MP Learning Targets			I can explain the relationship between the size of a factor and the size of the product.		

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CCSS Standard			6. Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.		
Learning Target			I can solve real world problems involving multiplication of fractions and mixed numbers and interpret the product in the context of the problem.		
Mathematical Practices			1. Make sense of problems and persevere in solving them.		
MP Learning Targets			I can explain and illustrate my solution strategy using visual fraction models or equations that represent the problem.		

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CCSS Cluster Statement	Analyze patterns and relationships	Perform operations with multi-digit whole numbers and with decimals to hundredths.	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Represent and interpret data.	Classify two-dimensional figures into categories based on their properties.
CCSS Standard			7. Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.1 a. Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. *For example, create a story context for (1/3) ÷ 4, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that (1/3) ÷ 4 = 1/12 because (1/12) × 4 = 1/3.* b. Interpret division of a whole number by a unit fraction, and compute such quotients. *For example, create a story context for 4 ÷ (1/5), and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4.* 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. *For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many1/3-cup servings are in 2 cups of raisins?*		

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CCSS Cluster Statement	Analyze patterns and relationships	Perform operations with multi-digit whole numbers and with decimals to hundredths.	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.	Represent and interpret data.	Classify two-dimensional figures into categories based on their properties.
Learning Target			I can create story contexts for problems involving division of a unit fraction by a whole number or division of a whole number by a unit fraction by interpreting division with fractions in the same way that I would interpret division with whole numbers. I can solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, and interpret the quotient in the context of the problem.		
Mathematical Practices			4. Model with mathematics.		
MP Learning Targets			I can explain and illustrate my solution strategy using visual fraction models or equations that represent the problem.		

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CCSS Cluster Statement				Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	
CCSS Standard				3. Recognize volume as an attribute of solid figures and understand concepts of volume measurement. a. A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. b. A solid figure which can be packed without gaps or overlaps using *n* unit cubes is said to have a volume of *n* cubic units.	
Learning Target				I can identify volume as an attribute of a solid figure. I can recognize that a cube with 1 unit side length is "one cubic unit" of volume.	
Mathematical Practices				3. Construct viable arguments and critique the reasoning of others.	
MP Learning Targets				I can explain how to find the volume of a solid I can decide with a partner a process for finding the volume of a solid figure. (i.e. filling it with unit cubes without gaps and overlaps).	

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CCSS Cluster Statement				Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	
CCSS Standard				4. Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units.	
Learning Target				I can measure the volume of a hollow three-dimensional figure by filling it with unit cubes without gaps and counting the number of unit squares.	
Mathematical Practices				5. Use appropriate tools strategically.	
MP Learning Targets				I can explain how to measure the volume of a three-dimensional figure .	

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CCSS Cluster Statement				Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition.	
CCSS Standard				5. Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. a. Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication. c. Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	
Learning Target				I can use unit cubes to determine the volume of a rectangular prism. I can solve word problems using volume.	
Mathematical Practices				8. Look for and express regularity in repeated reasoning.	
MP Learning Targets				I can explain volume in terms of multiplication and addition. I can explain how to use volume to solve a word problem. I can explain how to use unit cubes to determine the volume of a rectangular prism.	