Mathematical Thinking and Reasoning Standards		Mathematical Thinking and Reasoning Standards	
Number Sense and Operations		**MA.K12.MTR.1.1**	**Actively participate in effortful learning both individually and collectively.**
			Mathematicians who participate in effortful learning both individually and with others: • Analyze the problem in a way that makes sense given the task. • Ask questions that will help with solving the task. • Build perseverance by modifying methods as needed while solving a challenging task. • Stay engaged and maintain a positive mindset when working to solve tasks. • Help and support each other when attempting a new method or approach.
Algebraic Reasoning		**MA.K12.MTR.2.1**	**Demonstrate understanding by representing problems in multiple ways.**
			Mathematicians who demonstrate understanding by representing problems in multiple ways: • Build understanding through modeling and using manipulatives. • Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations. • Progress from modeling problems with objects and drawings to using algorithms and equations. • Express connections between concepts and representations. • Choose a representation based on the given context or purpose.
Measurement		**MA.K12.MTR.3.1**	**Complete tasks with mathematical fluency.**
			Mathematicians who complete tasks with mathematical fluency: • Select efficient and appropriate methods for solving problems within the given context. • Maintain flexibility and accuracy while performing procedures and mental calculations. • Complete tasks accurately and with confidence. • Adapt procedures to apply them to a new context. • Use feedback to improve efficiency when performing calculations.
Geometric Reasoning		**MA.K12.MTR.4.1**	**Engage in discussions that reflect on the mathematical thinking of self and others.**

			Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others: • Communicate mathematical ideas, vocabulary and methods effectively. • Analyze the mathematical thinking of others. • Compare the efficiency of a method to those expressed by others. • Recognize errors and suggest how to correctly solve the task. • Justify results by explaining methods and processes. • Construct possible arguments based on evidence.
Data Analysis and Probability		**MA.K12.MTR.5.1**	**Use patterns and structure to help understand and connect mathematical concepts.**
			"Mathematicians who use patterns and structure to help understand and connect mathematical concepts: • Focus on relevant details within a problem. • Create plans and procedures to logically order events, steps or ideas to solve problems. • Decompose a complex problem into manageable parts. • Relate previously learned concepts to new concepts. • Look for similarities among problems. • Connect solutions of problems to more complicated large-scale situations."
Fractions		**MA.K12.MTR.6.1**	**Assess the reasonableness of solutions.**
			Mathematicians who assess the reasonableness of solutions: • Estimate to discover possible solutions. • Use benchmark quantities to determine if a solution makes sense. • Check calculations when solving problems. • Verify possible solutions by explaining the methods used. • Evaluate results based on the given context.
Functions		**MA.K12.MTR.7.1**	**Apply mathematics to real-world contexts.**
			Mathematicians who apply mathematics to real-world contexts: • Connect mathematical concepts to everyday experiences. • Use models and methods to understand, represent and solve problems. • Perform investigations to gather data or determine if a method is appropriate. • Redesign models and methods to improve accuracy or efficiency.

Quarter	Strand	BEST Standard	Skills/Concepts	Clarifications/Transition Guide	Mathematical Thinking and Reasoning (MTR)	MAFS Standard	Text Correlation	Date
1	Number Sense	*MA.3.NSO.1*	*Understand the place value of four-digit numbers*					
1		MA.3.NSO.1.1	Read and write numbers from 0 to 10,000 using standard form, expanded form and word form.	New to grade 3		not found in 3rd MAFS found in 4th		
1		MA.3.NSO.1.2	Compose and decompose four-digit numbers in multiple ways using thousands, hundreds, tens and ones. Demonstrate each composition or decomposition using objects, drawings and expressions or equations.	New to grade 3		not found in 3rd MAFS found in 4th		
1		MA.3.NSO.1.3	Plot, order and compare whole numbers up to 10,000.	New to grade 3 **Clarification 1:** When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the thousands, hundreds, tens and ones digits. **Clarification 2:** Number lines, scaled by 50s, 100s or 1,000 s, must be provided and can be a representation of any range of numbers. Clarification 3: Within this benchmark, the expectation is to use symbols (<, > or =)		introduced in MAFS in 5th grade		
1		MA.3.NSO.1.4	Round whole numbers from 0 to 1,000 to the nearest 10 or 100.	Whole number range is now from 0 to 1000		MAFS.3.MBT.1.1		
1		MA.3.NSO.2	*Add and subtract multi-digit whole numbers. Build an understanding of multiplication and division operations*					
1		MA.3.NSO.2.1	Add and subtract multi-digit whole numbers including using a standard algorithm with procedural fluency.			not found in 3rd MAFS found in 4th		
2		MA.3.NSO.2.2	Explore multiplication of two whole numbers with products from 0 to 144, and related division facts.	Product range is now from 0 to 144 **Clarification 1:** Instruction includes equal groups, arrays, area models and equations. **Clarification 2:** Within the benchmark, it is the expectation that one problem can be represented in multiple ways and understanding how the different representations are related to each other. **Clarification 3:** Factors and divisors are limited to up to 12.				
2		MA.3.NSO.2.3	Multiply a one-digit whole number by a multiple of 10, up to 90, or a multiple of 100, up to 900, with procedural reliability	Multiplying a one-digit whole number by a multiple of 100 up to 900 is new to grade 3 **Clarification 1:** When multiplying one-digit numbers by multiples of 10 or 100, instruction focuses on methods that are based on place value.		MAFS.3.NBT.1.2 (EXCEPT FOR RED)		
2		MA.3.NSO.2.4	Multiply two whole numbers from 0 to 12 and divide using related facts with procedural reliability	Multiplication facts now range from 0 to 12 **Clarification 1:** Instruction focuses on helping a student choose a method they can use reliably.		similar to MAFS.3.OA.1.4		
4	Fraction	MA.3.FR.1	*Understand fractions as numbers and represent fractions.*					
4		MA.3.FR.1.1	Represent and interpret unit fractions in the form 1 *nn* as the quantity formed by one part when a whole is partitioned into n equal parts.	**Clarification 1:** This benchmark emphasizes conceptual understanding through the use of manipulatives or visual models. **Clarification 2:** Instruction focuses on representing a unit fraction as part of a whole, part of a set, a point on a number line, a visual model or in fractional notation. **Clarification 3:** Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.		MAFS.3.NF.1.1		
4		MA.3.FR.1.2	Represent and interpret fractions, including fractions greater than one, in the form of *mm nn* as the result of adding the unit fraction 1 *nn* to itself *mm* times	**Clarification 1:** Instruction emphasizes conceptual understanding through the use of manipulatives or visual models, including circle graphs, to represent fractions. **Clarification 2:** Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.		used to be in 4th now introduced in 3rd		

4		MA.3.FR.1.3	Read and write fractions, including fractions greater than one, using standard form, numeral-word form and word form.	New to grade 3 **Clarification 1:** Instruction focuses on making connections to reading and writing numbers to develop the understanding that fractions are numbers and to support algebraic thinking in later grades. **Clarification 2:** Denominators are limited to 2, 3, 4, 5, 6, 8, 10 and 12.	this have never be done before in 3rd grade		
4		MA.3.FR.2	*Order and compare fractions and identify equivalent fractions.*				
4		MA.3.FR.2.1	Plot, order and compare fractional numbers with the same numerator or the same denominator	**Clarification 1:** Instruction includes making connections between using a ruler and plotting and ordering fractions on a number line. **Clarification 2:** When comparing fractions, instruction includes an appropriately scaled number line and using reasoning about their size. **Clarification 3:** Fractions include fractions greater than one, including mixed numbers, with denominators limited to 2, 3, 4, 5, 6, 8, 10 and 12.	MAFS.3.NF.1.3d		
4		MA.3.FR.2.2	Identify equivalent fractions and explain why they are equivalent	New to grade 3 **Clarification 1:** Instruction includes identifying equivalent fractions and explaining why they are equivalent using manipulatives, drawings, and number lines. **Clarification 2:** Within this benchmark, the expectation is not to generate equivalent fractions. **Clarification 3:** Fractions are limited to fractions less than or equal to one with denominators of 2, 3, 4, 5, 6, 8, 10 and 12. Number lines must be given and scaled appropriately.	MAFS.3.NF.1.3 a-b; they are same standard but should have different subheadings		
2	Algebraic Reasoning	*MA.3.AR.1*	*Solve multiplication and division problems.*				
2		MA.3.AR.1.1	Apply the distributive property to multiply a one-digit number and two-digit number. Apply properties of multiplication to find a product of one-digit whole numbers.	**Clarification 1:** Within this benchmark, the expectation is to apply the associative and commutative properties of multiplication, the distributive property and name the properties. Refer to K-12 Glossary (Appendix C). **Clarification 2:** Within the benchmark, the expectation is to utilize parentheses. **Clarification 3:** Multiplication for products of three or more numbers is limited to factors within 12. Refer to Properties of Operations, Equality and Inequality (Appendix D).	MAFS.3.OA.2.5		
2		MA.3.AR.1.2	Solve one- and two-step real-world problems involving any of four operations with whole numbers.	**Clarification 1:** Instruction includes understanding the context of the problem, as well as the quantities within the problem. **Clarification 2:** Multiplication is limited to factors within 12 and related division facts. Refer to Situations Involving Operations with Numbers (Appendix A).	MAFS.3.OA.1.3 (the BEST standard is not as specific as MAFS)		
2		*MA.3.AR.2*	*Develop an understanding of equality and multiplication and division.*				
2		MA.3.AR.2.1	Restate a division problem as a missing factor problem using the relationship between multiplication and division.	**Clarification 1:** Multiplication is limited to factors within 12 and related division facts. **Clarification 2:** Within this benchmark, the symbolic representation of the missing factor uses any symbol or a letter.	MAFS.3.OA.1.4 AND MAFS.3.OA.2.6		
2		MA.3.AR.2.2	Determine and explain whether an equation involving multiplication or division is true or false(NEW VERBIAGE).	**Clarification 1:** Instruction extends the understanding of the meaning of the equal sign to multiplication and division. **Clarification 2:** Problem types are limited to an equation with three or four terms. The product or quotient can be on either side of the equal sign. **Clarification 3:** Multiplication is limited to factors within 12 and related division facts.	This is new/not part of MAFS		

2			MA.3.AR.2.3	Determine the unknown whole number in a multiplication or division equation, relating three whole numbers, with the unknown in any position.	**Clarification 1:** Instruction extends the development of algebraic thinking skills where the symbolic representation of the unknown uses any symbol or a letter. **Clarification 2:** Problems include the unknown on either side of the equal sign. **Clarification 3:** Multiplication is limited to factors within 12 and related division facts. Refer to Situations Involving Operations with Numbers (Appendix A).	MAFS.3.OA.1.4	
2			**MA.3.AR.3**	**Identify numerical patterns, including multiplicative patterns.**			
1			MA.3.AR.3.1	Determine and explain whether a whole number from 1 to 1,000 is even or odd.	New to grade 3 **Clarification 1:** Instruction includes determining and explaining using place value and recognizing patterns.	new used to be in 2nd grade MAFS	
2			MA.3.AR.3.2	Determine whether a whole number from 1 to 144 is a multiple of a given onedigit number.	New to grade 3 **Clarification 1**: Instruction includes determining if a number is a multiple of a given number by using multiplication or division.	new used to be in 4th grade MAFS	
1			MA.3.AR.3.3	Identify, create and extend numerical patterns.	Creating and extending numerical patterns are new to grade 3 **Clarification 1:** The expectation is to use ordinal numbers (1st, 2nd, 3rd, …) to describe the position of a number within a sequence. **Clarification 2:** Problem types include patterns involving addition, subtraction, multiplication or division of whole numbers.	MAFS.3.OA.4.9; It combines MAFS and BEST language	
3	Measurement		**MA.3.M.1**	**Measure attributes of objects and solve problems involving measurement**			
3			MA.3.M.1.1	Select and use appropriate tools to measure the length of an object, the volume of liquid within a beaker and temperature.	Units of measure of centimeter, half inch, quarter inch, degree, milliliter, half cup, and quarter cup are new to grade 3 **Clarification 1:** Instruction focuses on identifying measurement on a linear scale, making the connection to the number line. **Clarification 2:** When measuring the length, limited to the nearest centimeter and half or quarter inch. **Clarification 3:** When measuring the temperature, limited to the nearest degree. **Clarification 4:** When measuring the volume of liquid, limited to nearest milliliter and half or quarter cup.	MAFS.3.MD.1.2, MAFS.3.MD.2.4	
3			MA.3.M.1.2	Solve real-world problems involving any of the four operations with wholenumber lengths, masses, weights, temperatures or liquid volumes.	Including appropriate units; the comparison of attributes measured in the same units; and unit measures of yards, feet, inches, meters, centimeters, pounds, ounces, kilograms, grams, degrees Fahrenheit, degrees Celsius, gallons, quarts, pints, cups, liters, and milliliters are new to grade 3 **Clarification 1:** Within this benchmark, it is the expectation that responses include appropriate units. **Clarification 2**: Problem types are not expected to include measurement conversions. **Clarification 3:** Instruction includes the comparison of attributes measured in the same units. **Clarification 4:** Units are limited to yards, feet, inches; meters, centimeters; pounds, ounces; kilograms, grams; degrees Fahrenheit, degrees Celsius; gallons, quarts, pints, cups; and liters, milliliters.	MAFS.3.MD.1.2	
3			**MA.3.M.2.**	**Tell and write time and solve problems involving time.**			
3			MA.3.M.2.1	Using analog and digital clocks tell and write time to the nearest minute using a.m. and p.m. appropriately.	**Clarification 1:** Within this benchmark, the expectation is not to understand military time.	MAFS.3.MD.1.1	

3		MA.3.M.2.2	Solve one- and two-step real-world problems involving elapsed time	**Clarification 1:** Within this benchmark, the expectation is not to include crossing between a.m. and p.m.		MAFS.3.MD.1.1		
3	**Geometric Reasoning**	*MA.3.GR.1*	*Describe and identify relationships between lines and classify quadrilaterals.*					
3		MA.3.GR.1.1	Describe and draw points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines. Identify these in two-dimensional figures.	New to grade 3 **Clarification 1:** Instruction includes mathematical and real-world context for identifying points, lines, line segments, rays, intersecting lines, perpendicular lines and parallel lines. **Clarification 2:** When working with perpendicular lines, right angles can be called square angles or square corners.		MAFS.4.G.1.1, MAFS.4.G.1.2, MAFS.4.G.1,3; used to be in 4th grade		
3		MA.3.GR.1.2	Identify and draw quadrilaterals based on their defining attributes. Quadrilaterals include parallelograms, rhombi, rectangles, squares and trapezoids.	**Clarification 1:** Instruction includes a variety of quadrilaterals and a variety of non-examples that lack one or more defining attributes when identifying quadrilaterals. **Clarification 2:** Quadrilaterals will be filled, outlined or both when identifying. **Clarification 3:** Drawing representations must be reasonably accurate.		MAFS.4.G.1.1, MAFS.4.G.1.2, MAFS.4.G.1,3; used to be in 4th grade		
3		MA.3.GR.1.3	Draw line(s) of symmetry in a two-dimensional figure and identify linesymmetric two-dimensional figures.	New to grade 3 **Clarification 1:** Instruction develops the understanding that there could be no line of symmetry, exactly one line of symmetry or more than one line of symmetry. **Clarification 2:** Instruction includes folding paper along a line of symmetry so that both halves match exactly to confirm line-symmetric figures.		MAFS.4. G.1.3 used to be in 4th grade		
3		**MA.3.GR.2**	*Solve problems involving the perimeter and area of rectangles.*					
3		MA.3.GR.2.1	Explore area as an attribute of a two-dimensional figure by covering the figure with unit squares without gaps or overlaps. Find areas of rectangles by counting unit squares	**Clarification 1:** Instruction emphasizes the conceptual understanding that area is an attribute that can be measured for a two-dimensional figure. The measurement unit for area is the area of a unit square, which is a square with side length of 1 unit. **Clarification 2:** Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form (e.g., square centimeter or sq.cm.).				
3		MA.3.GR.2.2	Find the area of a rectangle with whole-number side lengths using a visual model and a multiplication formula.	**Clarification 1:** Instruction includes covering the figure with unit squares, a rectangular array or applying a formula. **Clarification 2:** Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form				
3		MA.3.GR.2.3	Solve mathematical and real-world problems involving the perimeter and area of rectangles with whole-number side lengths using a visual model and a formula.	**Clarification 1:** Within this benchmark, the expectation is not to find unknown side lengths. Clarification 2: Two-dimensional figures cannot exceed 12 units by 12 units and responses include the appropriate units in word form		MAFS.3.MD.4.8		
3		MA.3.GR.2.4	Solve mathematical and real-world problems involving the perimeter and area of composite figures composed of non-overlapping rectangles with wholenumber side lengths	**Clarification 1:** Composite figures must be composed of non-overlapping rectangles. **Clarification 2:** Each rectangle within the composite figure cannot exceed 12 units by 12 units and responses include the appropriate units in word form.		MAFS.3.MD.4.8		
4	**Data Analysis and Probability**	*MA.3.DP.1*	*Collect, represent and interpret numerical and categorical data*					
4		MA.3.DP.1.1	Collect and represent numerical and categorical data with whole-number values using tables, scaled pictographs, scaled bar graphs or line plots. Use appropriate titles, labels and units.	**Clarification 1:** Within this benchmark, the expectation is to complete a representation or construct a representation from a data set. **Clarification 2:** Instruction includes the connection between multiplication and the number of data points represented by a bar in scaled bar graph or a scaled column in a pictograph. Clarification 3: Data displays are represented both horizontally and vertically.		MAFS.3.MD.2.3		

| 4 | | MA.3.DP.1.2 | Interpret data with whole-number values represented with tables, scaled pictographs, circle graphs, scaled bar graphs or line plots by solving one- and two-step problems. | Use of circle graphs and line plots are new to grade 3 **Clarification 1:** Problems include the use of data in informal comparisons between two data sets in the same units. **Clarification 2:** Data displays can be represented both horizontally and vertically. Clarification 3: Circle graphs are limited to showing the total values in each category | | MAFS.3.MD.2.3 | | |

Quarter	Strand	BEST Standard	Skills/Concepts	Clarifications/Transition Guide	Mathematical Thinking and Reasoning (MTR)	MAFS Standard	Text Correlation	Date
1	Number Sense & Operations	MA.4.NSO.1.1	Express how the value of a digit in a multi-digit whole number changes if the digit moves one place to the left or right.			MAFS.4.NBT.1.1		
1		MA.4.NSO.1.2	Read and write multi-digit whole numbers from 0 to 1,000,000 using standard form, expanded form and word form.			MAFS.4.NBT.1.2		
1		MA.4.NSO.1.3	Plot, order, and compare multi-digit whole numbers up to 1,000,000.	**Clarification 1:** When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the hundred thousands, ten thousands, thousands, hundreds, tens and ones digits. **Clarification 2:** Scaled number lines must be provided and can be a representation of any range of numbers. **Clarification 3:** Within this benchmark, the expectation is to use symbols (<, > or =)		MAFS.4.NBT.1.2		
1		MA.4.NSO.1.4	Round whole numbers from 0 to 10,000 to the nearest 10, 100 or 1,000.	Changed from "round to any place."		MAFS.4.NBT.1.3		
1		MA.4.NSO.1.5	Plot, order, and compare decimals up to the hundredths.	**Clarification 1:** When comparing numbers, instruction includes using an appropriately scaled number line and using place values of the ones, tenths and hundredths digits. **Clarification 2:** Within the benchmark, the expectation is to explain the reasoning for the comparison and use symbols (<, > or =). **Clarification 3:** Scaled number lines must be provided and can be a representation of any range of numbers		MAFS.5.NBT.1.3 MAFS.4.NF.3.7		
1		MA.4.NSO.2.1	Recall multiplication facts with factors up to 12 and related division facts with automaticity.	Previously a 3rd grade standard up to 10		MAFS.3.OA.3.7		

1		MA.4.NSO.2.2	Multiply two whole numbers, up to three digits by up to two digits, with procedural reliability.	**Clarification 1:** Instruction focuses on helping a student choose a method they can use reliably. **Clarification 2:** Instruction includes the use of models or equations based on place value and the distributive property.		MAFS.4.NBT.2.5	
1		MA.4.NSO.2.3	Multiply two whole numbers, each up to two digits, including using a standard algorithm with procedural fluency.	Focus has shifted from area models to standard algorithm. Area models should still be included in above.		MAFS.4.NBT.2.5	
1		MA.4.NSO.2.4	Divide a whole number up to four digits by a one-digit whole number with procedural reliability. Represent remainders as fractional parts of the divisor.	**Clarification 1:** Instruction focuses on helping a student choose a method they can use reliably. **Clarification 2:** Instruction includes the use of models based on place value, properties of operations or the relationship between multiplication and division.		MAFS.4.NBT.2.6	
1		MA.4.NSO.2.5	Explore the multiplication and division of multi-digit whole numbers using estimation, rounding and place value.	**Clarification 1:** Instruction focuses on previous understanding of multiplication with multiples of 10 and 100, and seeing division as a missing factor problem. **Clarification 2:** Estimating quotients builds the foundation for division using a standard algorithm. **Clarification 3:** When estimating the division of whole numbers, dividends are limited to up to four digits and divisors are limited to up to two digits.		MAFS.4.OA.1.3	
1		MA.4.NSO.2.6	Identify the number that is one-tenth more, one-tenth less, one-hundredth more and one-hundredth less than a given number.				
1		MA.4.NSO.2.7	Explore the addition and subtraction of multi-digit numbers with decimals to the hundredths.	Decimal operations moved down from 5th grade. **Clarification:** Instruction includes connection to money and the use of manipulatives and models.		MAFS.4.NBT.2.4 MAFS.5.NBT.2.7	
2	**Fractions**	MA.4.FR.1.1	Model and express a fraction, including mixed numbers and fractions greater than one, with the denominator 10 as an equivalent fraction with th denominator 100.	**Clarification 1:** Instruction emphasizes conceptual understanding through the use of manipulatives, visual models, number lines or equations.		MAFS.4.NF.3.5	

2		MA.4.FR.1.2	Use decimal notation to represent fractions with denominators of 10 or 100, including mixed numbers and fractions greater than 1, and use fractional notation with denominators of 10 or 100 to represent decimals.	**Clarification 1:** Instruction emphasizes conceptual understanding through the use of manipulatives visual models, number lines or equations. **Clarification 2:** Instruction includes the understanding that a decimal and fraction that are equivalent represent the same point on the number line and that fractions with denominators of 10 or powers of 10 may be called decimal fractions.		MAFS.4.NF.3.6	
2		MA.4.FR.1.3	Identify and generate equivalent fractions, including fractions greater than one. Describe how the numerator and denominator are affected when the equivalent fraction is created.	Missing: Explain why a fraction is equivalent to another, with attention to how the number and size of parts differ even though the two fractions are the same size. **Clarification 1:** Instruction includes the use of manipulatives, visual models, number lines or equations. **Clarification 2:** Instruction includes recognizing how the numerator and denominator are affected when equivalent fractions are generated.		MAFS.4.NF.1.1	
2		MA.4.FR.1.4	Plot, order and compare fractions, including mixed numbers and fractions greater than one, with different numerators and different denominators.	**Clarification 1:** When comparing fractions, instruction includes using appropriately scaled number lines and reasoning about their size. **Clarification 2:** Instruction includes using benchmark quantities such as 0, 1/4, 1/2, 3/4, and 1 to compare fractions. **Clarification 3:** Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, and 100 **Clarification 4:** Within this benchmark, the expectation is to use symbols (<, > or =) Missing: Recognize the comparisons are valid only when two fractions refer to the same whole.		MAFS.4.NF.1.2	
2		MA.4.FR.2.1	Decompose a fraction, including mixed numbers and fractions greater than one, into a sum of fractions with the same denominator in multiple ways. Demonstrate each decomposition with objects, drawings and equations.	**Clarification 1:** Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, and 100 Missing: Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.		MAFS.4.NF.2.3	

2		MA.4.FR.2.2	Add and subtract fractions with like denominators, including mixed numbers and fractions greater than one, with procedural reliability.	**Clarification 1:** Instruction includes the use of word form, manipulatives, drawings, the properties of operations, or number lines. **Clarification 2:** Expectation is not to simplify. Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, 100. Missing: Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.		MAFS.4.NF.2.3	
2		MA.4.FR.2.3	Explore the addition of a fraction with denominator of 10 to a fraction with denominator of 100 using equivalent fractions.	Wording changed from Express to Explore. **Clarification 1:** Instruction includes use of visual models. **Clarification 2:** The expectation is not to simplify.		MAFS.4.NF.3.5	
2		MA.4.FR.2.4	Extend previous understanding of multiplication to explore the multiplication of a fraction by a whole number or a whole number by a fraction.	Wording changed from apply to explore. **Clarification 1:** Instruction includes the use of visual models or number lines and the connection to the commutative property of multiplication. **Clarification 2:** The expectation is not to simplify. **Clarification 3:** Fractions being multiplied are limited to less than 1. All denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, 100. Missing: Understand a fraction a/b as a multiple of 1/b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.		MAFS.4.NF.2.4	

1 & 2	**Algebraic Reasoning**	MA.4.AR.1.1	Solve real-world problems involving multiplication and division of whole numbers including problems in which remainders must be interpreted within the context.	Missing the word multi-step. Missing: distinguishing between multiplicative comparison from additive comparison. Missing: Represent verbal statements of multiplicative comparisons as multiplication equations. **Clarification 1:** Problems involving multiplication include multiplicative comparisons **Clarification 2:** Depending on the context, the solution to a division problem with a remainder may be the whole number part of the quotient, the whole number part of the quotient with the remainder, the whole number part of the quotient plus 1, or the remainder. **Clarification 3:** Multiplication is limited to products of up to 3 digits by 2 digits. Division is limited to up to 4 digits divided by 1 digit.		MAFS.4.OA.1.1 MAFS.4.OA.1.2 MAFS.4.OA.1.3		
3		MA.4.AR.1.2	Solve real-world problems involving addition and subtraction of fractions with like denominators, including mixed numbers and fractions greater than one.	**Clarification 1:** Problems include creating real-world situations based on an equation or representing a real-world problem with a visual model or equation. **Clarification 2:** Fractions within problems must reference the same whole. **Clarification 3:** Within this benchmarck, the expectation is not to simplify or use lowest terms. **Clarification 4:** Denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, 100		MAFS.4.NF.2.3d		
3		MA.4.AR.1.3	Solve real-world problems involving multiplication of a fraction by a whole number or a whole number by a fraction.	**Clarification 1:** Problems include creating real-world situations based on an equation or representing a real-world problem with a visual model or equation. **Clarification 2:** Fractions within problems must reference the same whole. **Clarification 3:** Within this benchmarck, the expectation is not to simplify or use lowest terms. **Clarification 4:** Denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, 100.		MAFS.4.NF.2.4c		
3		MA.4.AR.2.1	Determine and explain whether an equation involving any of the four operations with whole numbers is true or false.	Clarification 1: Multiplication is limited to whole number factors within 12 and related division facts.		MAFS.4.OA.1.a		

3		MA.4.AR.2.2	Given a mathematical or real-world context, write an equation involving multiplication or division to determine the unknown whole number with the unknown in any position.	**Clarification 1:** Uses a letter for the unknown. **Clarification 2:** Problems include the unknown on either side of the equal sig. **Clarificaion 3:** Multiplication is limited to factors within 12 and related division facts.		MAFS.4.OA.1.b	
1		MA.4.AR.3.1	Determine factor pairs for a whole number from 0 to 144. Determine whether a whole number from 0 to 144 is prime, composite or neither.	**Clarification 1:** Instruction includes the connection to the relationship between multiplication and division with patterns and divisibility rules. **Clarification 2:** The number 0 and 1 are neither prime nor composite. Missing (Moved to 3rd- must be covered during transition): Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a givenone-digit number.		MAFS.4.OA.2.4	
1		MA.4.AR.3.2	Generate, describe, and extend a numerical pattern that follows a given rule.	**Clarification 1:** Instruction includes patterns within a mathematical or real-world context. Missing: Identify apparent features of the pattern that were not explicit in the rule itself.		MAFS.4.OA.3.5	
4	**Measurement**	MA.4.M.1.1	Select and use appropriate tools to measure attributes of objects.	**Clarification 1:** Attributes include length, volume, weight, mass, and temperature. **Clarification 2:** Instruction includes digital measurements and scales that are not linear in appearance. **Clarification 3:** When recording measurements, use fractions and decimals where appropriate.		MAFS.K12.MP.5.1	
3		MA.4.M.1.2	Convert within a single system of measurement using the units: yards, feet, inches; kilometers, meters, centimeters, millimeters; pounds, ounces; kilograms, grams; gallons, quarts, pints, cups; liter, milliliter; and hours, minutes, seconds.	**Clarification 1:** Instruction includes understanding how to convert from smaller to larger units or from larger to smaller units. **Clarification 2:** Within the benchmark, the expectation is not to convert from grams to kilograms, meters to kilometers, or milliliters to liters. **Clarification 3:** Problems involving fractions are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12, 16,and 100. Missing: Record measurement equivalents in a two-column table.		MAFS.4.MD.1.1	

4		MA.4.M.2.1	Solve two-step real-world problems involving distances and intervals of time using any combination of the four operations.	Missing: Represent fractional quantities of distance and intervals of time using linear models. Clarification 1:Problems involving fractions will include addition and subtraction with like denominators and multiplication of a fraction by a whole number or a whole number by a fraction. Clarification 2: Problems involving fractions are limited to denominators of 2, 3, 4, 5, 6, 8, 10, 12, 16, and 100. Clarification 3: Within the benchmark, the expectation is not to use decimals.		MAFS.4.MD.1.2	
4		MA.4.M.2.2	Solve one- and two-step addition and subtraction real-world problems involving money using decimal notation.			MAFS.4.MD.1.2	
2	Geometric Reasoning	MA.4.GR.1.1	Informally explore angles as an attribute of two-dimensional figures. Identify and classify angles as acute, right, obtuse, straight or reflex.	Clarification 1: includes classifying angles using benchmark angles of 90 degrees and 180 degrees in two-dimensional figures. Clarification 2: identifying angles, the expectation includes two-dimensional figures and real-world pictures. Missing: An angle is measured with reference to a circle with its center at the common endpoint of the rays. Missing (Moved to 3rd Grade- Must be covered during transition): Draw points, lines, line segments, rays, perpendicular, and parallel lines.		MAFS.4.G.1.1	
2		MA.4.GR.1.2	Estimate angle measures. Using a protractor, measure angles in whole-number degrees and draw angles of specified measure in whole-number degrees. Demonstrate that angle measure is additive.	Clarification 1: includes measuring given angles and drawing angles using protractors. Instruction includes estimating angle measures using benchmark angles (30 degrees, 45 degrees, 60 degrees, 90 degrees, and 180 degrees). Clarification 2: focuses on the understanding that angles can be decomposed into non-overlapping angles whose measure sum to the measure of the original angle.		MAFS.4.MD.3.6 MAFS.4.MD.3.7	
2		MA.4.GR.1.3	Solve real-world and mathematical problems involving unknown whole-number angle measures. Write an equation to represent the unknown.				

2		MA.4.GR.2.1	Solve perimeter and area mathematical and real-world problems, including problems with unknown sides, for rectangles with whole-number side lengths.	Clarification 1: Symbolic representation of the unknown uses a letter. Clarification 2: Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit. Clarification 3: Responses inclue the appropriate units in word form.		MAFS.4.MD.1.3		
2		MA.4.GR.2.2	Solve problems involving rectangles with the same perimeter and different areas or with the same area and different perimeters.	Clarification 1: Instruction focuses on the conceptual understanding of the relationship between perimeter and area. Clarification 2: Within this benchmark, rectangles are limited to having whole-number side lengths. Clarification 3: Problems involving multiplication are limited to products of up to 3 digits by 2 digits. Problems involving division are limited to up to 4 digits divided by 1 digit. Clarification 4: Responses include the appropriate units in word form.				
4	Data Analysis and Probability	MA.4.DP.1.1	Collect and represent numerical data, including fractional values, using tables, stem-and-leaf plots or line plots.	Clarification 1: Denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12,16, and 100.		MAFS.4.MD.2.4		
4		MA.4.DP.1.2	Determine the mode, median or range to interpret numerical data including fractional values, represented with tables, stem-and-leaf plots or line plots.					
4		MA.4.DP.1.3	Solve real-world problems involving numerical data.	Clarification 1: Instruction includes any of the four operations to solve problems. Clarification 2: Data involving fractions with like denominators are limited to 2, 3, 4, 5, 6, 8, 10, 12, 16, and 100. Fractions can be greater than 1. Clarification 3: Data involving decimals are limited to hundredths.		MAFS.4.MD.2.4		
				Missing from BEST (Moved to 3rd- Must be covered during transition): Fluently add and subtract multi-digit whole numbers using the standard algorithm.		MAFS.4.NBT.2.4		

				Missing from BEST (Moved to 3rd- Must be covered during transition): Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified dize. Tecognize right triangle as a category, and identify right trangles.	MAFS.4.G.1.2		
				Missing from BEST (Moved to 3rd- Must be covered during transition): Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	MAFS.4.G.1.3		

Quarter	Strand	BEST Standard	Skills/Concepts	Clarifications/Transition Guide	Mathematical Thinking and Reasoning (MTR)	MAFS Standard	Text Correlation	Date
1	Number Sense and Operations	MA.5.NSO.1	Understand the place value of multi-digit numbers with decimals to the thousandths place.			MAFS.5.NBT.1.1		
1*		MA.5.NSO.1.1	Express how the value of a digit in a multi-digit number with decimals to the thousandths changes if the digit moves one or more places to the left or right.	MAFS specified that a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 if what it represents in the place to its left.		MAFS.5.NBT.1.1 MAFS.5.NBT.1.2		
1*		MA.5.NSO.1.2	Read and write multi-digit numbers with decimals to the thousandths using standard form, word form and expanded form.			MAFS.5.NBT.1.3		
1		MA.5.NSO.1.3	Compose and decompose multi-digit numbers with decimals to the thousandths in multiple ways using the values of the digits in each place. Demonstrate the compositions or decompositions using objects, drawings and expressions or equations.					
1		MA.5.NSO.1.4	Plot, order and compare multi-digit numbers with decimals up to the thousandths.	**Clarification 1:** Instruction includes use of appropriately scaled number line and using place values of digits. **Clarification 2:** Must use appropriately scaled number lines. **Clarification 3:** Expected to use <, =, and > symbols for comparisons.		MAFS.5.NBT.1.3		
1		MA.5.NSO.1.5	Round multi-digit numbers with decimals to the thousandths to the nearest hundredth, tenth or whole number.			MAFS.5.NBT.1.4		
1		MA.5.NSO.2	Add, subtract, multiply and divide multi-digit numbers.					
1		MA.5.NSO.2.1	Multiply multi-digit whole numbers including using a standard algorithm with procedural fluency.			MAFS.5.NBT.2.5		
1*		MA.5.NSO.2.2	Divide multi-digit whole numbers, up to five digits by two digits, including using a standard algorithm with procedural fluency. Represent remainders as fractions.	**Clarification 1:** Expectation is not to use simplest form. Missing: Dividing 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.		MAFS.5.NBT.2.6		
1*		MA.5.NSO.2.3	Add and subtract multi-digit numbers with decimals to the thousandths, including using a standard algorithm with procedural fluency.	Missing: 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 ecplain the reasoning used.		MAFS.5.NBT.2.7		

1*			MA.5.NSO.2.4	Explore the multiplication and division of multi-digit numbers with decimals to the hundredths using estimation, rounding and place value.	**Clarification 1:** Estimating quotients builds the foundation for division using a standard algorithm. **Clarification 2:** Instruction includes the use of models based on place value and the properties of operations		MAFS.5.NBT.2.7	
1*			MA.5.NSO.2.5	Multiply and divide a multi-digit number with decimals to the tenths by one-tenth and one-hundredth with procedural reliability.	**Clarification 1:** Instruction focuses on place value of the digit when multiplying or dividing. Missing: using concrete models or drawings and strategies based on the relationship between addition and subtraction; relate the strategy to a written method and ecplain the reasoning used.		MAFS.5.NBT.2.7	
2		**Fractions**	MA.5.FR.1	Interpret a fraction as an answer to a division problem			MAFS.5.NF.1.1	
2*			MA.5.FR.1.1	Given a mathematical or real-world problem, represent the division of two whole numbers as a fraction.	**Clarification 1:** Instruction includes making a connection between fractions and division by understanding that fractions can also reprsent division of a numerator by a denominator. **Clarification 2:** The expectation is not to simplify to lowest terms. **Clarification 3:** Fractions can include fractions greater than one.		MAFS.5.NF.2.3	
2			MA.5.FR.2	Perform operations with fractions.				
2			MA.5.FR.2.1	Add and subtract fractions with unlike denominators, including mixed numbers and fractions greater than 1, with procedural reliability.	**Clarification 1:** Instruction includes the use of estimation, manipulatives, drawings, or the properties of operations. **Clarification 2:** Instruction builds on the understanding from previous grades of factors up to 12 and their multiples. Missing: By replacing given fractions with equivalent fractions withl ike denominators.		MAFS.5.NF.1.1	
2*			MA.5.FR.2.2	Extend previous understanding of multiplication to multiply a fraction by a fraction, including mixed numbers and fractions greater than 1, with procedural reliability.	**Clarification 1:** Instruction includes use of manipulatives, drawings, or the properties of operations. **Clarification 2:** Denominators limited to whole numbers up to 20. Missing: Interpret the product $(a/b) \times q$ as a partition of q into b equal parts as a result of a sequence of operations $a \times q / b$. Missing: Find the area of a rectangle with fractional side lengths and represent fraction products as rectangular areas.		MAFS.5.NF.2.4	
2*			MA.5.FR.2.3	When multiplying a given number by a fraction less than 1 or a fraction greater than 1, predict and explain the relative size of the product to the given number without calculating.	**Clarification 1:** Instruction focuses on the connection to decimals, estimation and assessing the resasonableness of an answer. Missing: The term scaling		MAFS.5.NF.2.5	

2*		MA.5.FR.2.4	Extend previous understanding of division to explore the division of a unit fraction by a whole number and a whole number by a unit fraction.	**Clarification 1:** Instruction includes the use of manipulatives, drawings, or the properties of operations. **Clarification 2:** Refer to Appendix A for "Situations Involving Operations with Numbers"		MAFS.5.NF.2.7		
2	**Algebraic Reasoning**	MA.5.AR.1	Solve problems involving the four operations with whole numbers and fractions.					
2		MA.5.AR.1.1	Solve multi-step real-world problems involving any combination of the four operations with whole numbers, including problems in which remainders must be interpreted within the context.	**Clarification 1:** Depending on the context, the solution of a division problem with a remainder may be the whole number part of the quotient, the whole number part of the quotient with the remainder, the whole number part of the quotient plus 1, or the remainder.		Review of MAFS. 4.OA.1.3		
2*		MA.5.AR.1.2	Solve real-world problems involving the addition, subtraction or multiplication of fractions, including mixed numbers and fractions greater than 1.	**Clarification 1:** Instruction includes the use of visual models and equations to represent the problem.		MAFS.5.NBT.2.6 MAFS.5.NF.1.2		
2		MA.5.AR.1.3	Solve real-world problems involving division of a unit fraction by a whole number and a whole number by a unit fraction.	**Clarification 1:** Instruction invludes the use of visual models and equations to represent the problem.		MAFS.5.NF.2.7c		
2		MA.5.AR.2	Demonstrate an understanding of equality, the order of operations and equivalent numerical expressions					
2*		MA.5.AR.2.1	Translate written real-world and mathematical descriptions into numerical expressions and numerical expressions into written mathematical descriptions.	**Clarification 1:** Expressions are limited to any combination of the arithemetic operations, including parentheses, with whole numbers, decimals, and fractions **Clarification 2**: The expectation is not to include exponents or nested grouping symbols.		MAFS.5.OA.1.1 MAFS.5.OA.1.2		
3*		MA.5.AR.2.2	Evaluate multi-step numerical expressions using order of operations.	**Clarification 1:** Multi-step expressions are limited to any combination of arithmetic operations, including parentheses, with whole numbers, decimals, and fractions. **Clarification 2:** The expectation is not to include exponents or nested grouping symbols. **Clarification 3:** Decimals are limited to hundredths. Expressions cannot include division of a fraction by a fraction.		MAFS.5.OA.1.1		
3		MA.5.AR.2.3	Determine and explain whether an equation involving any of the four operations is true or false.	**Clarification 1:** Problem types include equations that include parentheses but not nested parentheses. **Clarification 2**: Instruction focuses on the connection between properties of equality and order of operations.				

3		MA.5.AR.2.4	Given a mathematical or real-world context, write an equation involving any of the four operations to determine the unknown whole number with the unknown in any position.	**Clarification 1:** Instruction extends the development of algebraic thinking where the unknown letter is recognized as a variable. **Clarification 2:** Problems include the unknown and different operations on either side of the equal side.			
3		MA.5.AR.3	Analyze patterns and relationships between inputs and outputs.				
3*		MA.5.AR.3.1	Given a numerical pattern, identify and write a rule that can describe the pattern as an expression.	**Clarification 1:** Rules are limited to one or two operations using whole numbers. Missing: Generate two numerical patterns using two given rules.	MAFS.5.OA.2.3		
3*		MA.5.AR.3.2	Given a rule for a numerical pattern, use a two-column table to record the inputs and outputs.	**Clarification 1:** Instruction builds a foundation for proportional and linear relationships in later grades. **Clarification 2:** Rules are limited to one or two operations using whole numbers. This connects to coordinate plane (MA. GR.4.2)	MAFS.5.OA.2.3		
3	**Measurement**	MA.5.M.1	Convert measurement units to solve multi-step problems.				
3*		MA.5.M.1.1	Solve multi-step real-world problems that involve converting measurement units to equivalent measurements within a single system of measurement.	**Clarification 1:** Within the benchmark, the expectation is not to memorize the conversions. **Clarification 2**: Conversions include length, time, volume and capacity represented as whole numbers, fractions and decimals.	MAFS.5.MD.1.1		
3		MA.5.M.2	Solve multi-step real-world problems that involve converting measurement units to equivalent measurements within a single system of measurement.				
3		MA.5.M.2.1	Solve multi-step real-world problems involving money using decimal notation.	Extension of 4th Grade MA.4.M.2.2			
4	**Geometric Reasoning**	MA.5.GR.1	Classify two-dimensional figures and three-dimensional figures based on defining attributes				
4*		MA.5.GR.1.1	Classify triangles or quadrilaterals into different categories based on shared defining attributes. Explain why a triangle or quadrilateral would or would not belong to a category.	**Clarification 1:** Triangles include scalene, isosceles, equilateral, acute, obtuse and right; quadrilaterals include parallelograms, rhombi, rectangles, squares and trapezoids. Missing: Use of Venn Diagrams to classify and organize	MAFS.5.G.2.3 MAFS.5.G.2.4		
4		MA.5.GR.1.2	Identify and classify three-dimensional figures into categories based on their defining attributes. Figures are limited to right pyramids, right prisms, right circular cylinders, right circular cones and spheres.	**Clarification 1:** Defining attributes include the number and shape of faces, number and shape of bases, whether or not there is an apex, curved or straight edges and curved or flat faces.			
4		MA.5.GR.2	Find the perimeter and area of rectangles with fractional or decimal side lengths				

4		MA.5.GR.2.1	Find the perimeter and area of a rectangle with fractional or decimal side lengths using visual models and formulas.	**Clarification 1**: Instruction includes finding the area of a rectangle with fractional side lengths by tiling it with squares having unit fraction side lengths and showing that the area is the same as would be found by multiplying the side lengths. **Clarification 2**: Responses include the appropriate units in word form.		MAFS.5.NF.2.4	
4		MA.5.GR.3	Solve problems involving the volume of right rectangular prisms.				
4*		MA.5.GR.3.1	Explore volume as an attribute of three-dimensional figures by packing them with unit cubes without gaps. Find the volume of a right rectangular prism with whole-number side lengths by counting unit cubes.	**Clarification 1**: Instruction emphasizes the conceptual understanding that volume is an attribute that can be measured for a three-dimensional figure. The measurement unit for volume is the volume of a unit cube, which is a cube with edge length of 1 unit.		MAFS.5.MD.3.3	
4*		MA.5.GR.3.2	Find the volume of a right rectangular prism with whole-number side lengths using a visual model and a formula.	**Clarification 1**: Instruction includes finding the volume of right rectangular prisms by packing the figure with unit cubes, using a visual model or applying a multiplication formula. **Clarification 2**: Right rectangular prisms cannot exceed two-digit edge lengths and responses include the appropriate units in word form.		MAFS.5.MD.3.4	
4*		MA.5.GR.3.3	Solve real-world problems involving the volume of right rectangular prisms, including problems with an unknown edge length, with whole-number edge lengths using a visual model or a formula. Write an equation with a variable for the unknown to represent the problem.	**Clarification 1**: Instruction progresses from right rectangular prisms to composite figures composed of right rectangular prisms. **Clarification 2**: When finding the volume of composite figures composed of right rectangular prisms, recognize volume as additive by adding the volume of non-overlapping parts. **Clarification 3**: Responses include the appropriate units in word form.		MAFS.5.MD.3.5	
4		MA.5.GR.4	Plot points and represent problems on the coordinate plane.				
4*		MA.5.GR.4.1	Identify the origin and axes in the coordinate system. Plot and label ordered pairs in the first quadrant of the coordinate plane	**Clarification 1**: Instruction includes the connection between two-column tables and coordinates on a coordinate plane. **Clarification 2**: Instruction focuses on the connection of the number line to the x- and y-axis. **Clarification 3**: Coordinate planes include axes scaled by whole numbers. Ordered pairs contain only whole numbers.		MAFS.5.G.1.1	
4*		MA.5.GR.4.2	Represent mathematical and real-world problems by plotting points in the first quadrant of the coordinate plane and interpret coordinate values of points in the context of the situation.	**Clarification 1**: Coordinate planes include axes scaled by whole numbers. Ordered pairs contain only whole numbers.		MAFS.5.G.1.2	
4	**Data Analysis & Probablity**	MA.5.DP.1	Collect, represent and interpret data and find the mean, mode, median or range of a data set.				
4*		MA.5.DP.1.1	Collect and represent numerical data, including fractional and decimal values, using tables, line graphs or line plots.	**Clarification 1**: Within this benchmark, the expectation is for an estimation of fractional and decimal heights on line graphs. **Clarification 2**: Decimal values are limited to hundredths. Denominators are limited to 1, 2, 3 and 4. Fractions can be greater than one.		MAFS.5.MD.2.2	

4		MA.5.DP.1.2	Interpret numerical data, with whole-number values, represented with tables or line plots by determining the mean, mode, median or range.	**Clarification 1:** Instruction includes interpreting the mean in real-world problems as a leveling out, a balance point or an equal share.				
				Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, nd explain patterns in the placement of the decimal point when a decimal is multiplied or divide by a power of 10. MOVED TO 4th GRADE- Must be covered during transition.	MAFS.5.NBT.1.2			