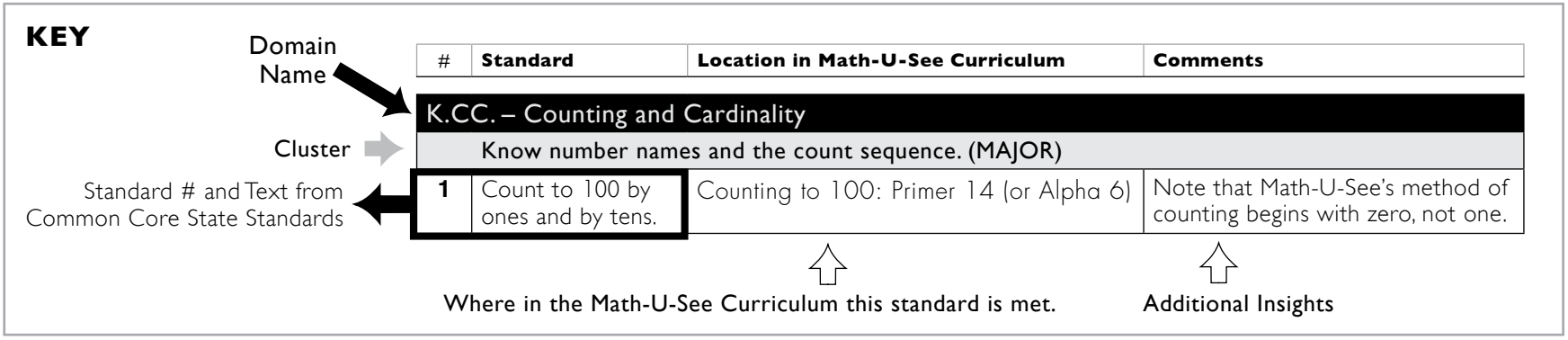
Math-U-See® Correlation with the Common Core State Standards for Mathematical Content for Fourth Grade

The fourth-grade standards highlight all four operations, explore fractions in greater detail, and introduce decimals; these topics are spread across Math-U-See's Gamma, Delta, and Epsilon. The use of the Fraction Overlays helps students visualize how the addition and subtraction of fractions work and focuses students on conceptual understanding, rather than rote memorization of procedures. Fundamentals of plane geometry are covered in Delta, and students also learn how to use a protractor. To keep math facts fresh, be sure to utilize the online Worksheet Generator and the online Math Drill.



#	Standard	Location in Math-U-See Curriculum	Comments
4.OA.– Operations and Algebraic Thinking			
	Use the four operations with whole numbers to solve problems. (MAJOR)		
1	Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.	This language is explictly used in the Gamma Instruction Manual for each multiplication lesson. Practice for this is found in the Gamma Student Workbook 4–10.	
2	Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.	Multiplicative comparison is discussed in Gamma 4. Solve for an Unknown: Gamma 8, 20	Word problems of this type are found in the student worksheets for Gamma 4 to 10 and Delta 2 and 3.

3	Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.	Multi-Step Word Problems (division): Delta Instruction Manual 15, 21, and 27. Using Estimation and Common Sense to Check Word Problems: Delta 21 After Delta 16, remainders must be interpreted, and Delta Application and Enrichment 16G, 23G, and 27G have additional word problems that require interpreting remainders. Solving for an Unknown: Delta 1, 4G	Addition, subtraction, and multiplication problems of this nature are considered review; examples can be found in Alpha, Beta, Gamma and in the systematic review pages in Delta.
	Gain familiarity with factors and multiples. (Supporting)		
4	Find all factor pairs for a whole number in the range 1–100. 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 given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.	Finding Factors: Gamma 26 Prime and Composite Numbers: Gamma 29 Delta 1–12 help students determine whether a whole number 1–100 is a multiple of a one-digit number.	Epsilon 11 features fun, helpful shortcuts to finding factors. Gamma 26G offers a simpler worksheet version. Some students may find these tips extremely useful at this stage.
	Generate and analyze patterns. (Additional)		
5	Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*	Patterns: Gamma 22G, 24G	Math-U-See exceeds this standard by also providing opportunities to chart the growth of a pattern in Delta 11G, 13G, and 14G, to find patterns in lists of equations in Delta 17G, and to fill in missing numbers in pattern charts in Delta 20G and 25G.
4.NBT. – Number & Operations in Base Ten (Grade 4 expectations in this domain are limited to whole numbers less than or equal to 1,000,000.) (MAJOR)			
	Use the four operations with whole numbers to solve problems. (MAJOR)		
1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*	This standard is reviewed in Delta 14.	Place value is a foundational principle in Math-U-See, and the general concept of this standard was mastered in Alpha. To find review problems, refer to the lessons listed for 1.NBT.1, 2.NBT.1, and 3.NBT.1.

2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.	Inequalities: Beta 3 Expanded Notation: Delta 15	Beta 3 exceeds this standard by covering up to three-digit numbers.
3	Use place value understanding to round multi-digit whole numbers to any place.	Place value and rounding is reviewed in Delta 21.	Place value is a foundational concept in Math-U-See; this standard is mastered to hundreds by Beta 17 and to thousands by Gamma. See lessons listed for 3.NBT.1.
	Use place value understanding and properties of operations to perform multi-digit arithmetic. (MAJOR)		
4	Fluently add and subtract multi-digit whole numbers using the standard algorithm.	Review is available in Delta Quick Reviews on 4D, 6D, and 9D.	This standard is mastered by the end of Beta 28 and is considered review. See lessons listed for 2.NBT.5-7 and 3.NBT.2.
5	Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.	This standard is mastered by the end of Gamma 25, and review is found throughout Delta in the Systematic Review.	Math-U-See exceeds this standard by introducing up to four digits by three digits by the end of Gamma 28.
6	Find whole-number quotients and remainders with up to four-digit dividends and one-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.	Four Digit by One Digit: Delta 23 Delta 1 and 2 thoroughly discuss the relationship between multiplication and division.	Math-U-See surpasses this standard by covering up to six-digit dividends and three-digit divisors by the end of Delta 25.
4.NF. – Number and Operations - Fractions (Grade 4 expectations in this domain are limited to fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 & 100.)			
	Extend understanding of fraction equivalence and ordering. (MAJOR)		
1	Explain why a fraction *a/b* is equivalent to a fraction *(n x a)/(n x b)* by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.	Common Factors: Epsilon 12, Zeta Quick Review 2D & 3D	Although Epsilon 4 is titled Equivalent Fractions, it should be treated as a step towards the fuller understanding presented in Epsilon 12 necessary to meet this standard. There is an excellent summary in Zeta Quick Review 2D and 3D; we strongly recommend utilizing it.

2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	Comparing Fractions using Rule of 4: Epsilon 7	Math-U-See's Fraction Overlays help students visualize the process of creating common denominators and comparing two fractions.
	Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers. (MAJOR)		
3	Understand a fraction *a/b* with *a* > 1 as a sum of fractions *1/b*.		
3a	Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.	Add and Subtract Fractions: Epsilon 3	Note that Math-U-See's Fraction Overlays are required for instruction of fractions in Epsilon.
3b	Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*	Add and Subtract Fractions: Epsilon 3	Students must complete Epsilon Application and Enrichment 4G in order to master this standard fully.
3c	Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.	Addition and Subtraction of Mixed Numbers: Epsilon 17	
3d	Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.	Add and Subtract Fractions: Epsilon 3, 5G	Epsilon Application and Enrichment 5G gives strategies specifically for deciding whether to add or subtract in a fraction word problem.
4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.		
4a	Understand a fraction *a/b* as a multiple of *1/b*. *For example, use a visual fraction model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equation 5/4 = 5 x (1/4).*	Fraction of a Number: Epsilon 1 Fraction of One: Epsilon 2	These lessons are similar to those in Delta 27 and 29, but the Epsilon lessons listed are more detailed.

4b	Understand a multiple of a/b as a multiple of *1/b,* and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5), recognizing this product as 6/5. (In general, n x (a/b) = (n x a)/b).*	Fraction of a Number: Epsilon 1 Fraction of One: Epsilon 2 Multiplying Fractions By a Whole Number: Epsilon 9	Note that Math-U-See surpasses this standard by presenting multiplication of a fraction by a whole number as a subset of multiplication of a fraction by a fraction, since a whole number is simply itself over one.
4c	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*	Fraction of a Number: Epsilon 1 Fraction of One: Epsilon 2, including 2G Multiplying Fractions By a Whole Number: Epsilon 9 Multi-Step Word Problems: Epsilon Instruction Manual Lessons 6 and 12	Word problems for this standard can be found starting in Epsilon 9, but additional problems can be adapted from previous lessons that were using the algorithm for finding a fraction of a number (Delta 27, Epsilon 1). Note that finding the fraction of a number (which is actually multiplication of a number by a fraction) is covered earlier than multiplication of fractions in the Math-U-See curriculum.
	Understand decimal notation for fractions, and compare decimal fractions. (MAJOR)		
5	Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. (Students who can generate equivalent fractions can develop strategies for adding fractions with unlike denominators in general. But addition and subtraction with unlike denominators in general is not a requirement at this grade.) *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*	Addition and Subtraction: Epsilon 5	Students have the necessary skills to complete this type of problem after Epsilon 5; actual problems involving tenths and hundredths are found on Application and Enrichment Epsilon 15G.
6	Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*	Fraction to Decimals to Percentages: Epsilon 29	
7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.	Comparing Decimals: Epsilon 29, including 29G	Math-U-See surpasses this standard by covering thousandths as well (See 5.NF.3b)

4.MD. – Measurement and Data			
	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. (Supporting)		
1	Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml, hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*	Ounces and Pounds: Gamma 27 Inches and Centimeters: Beta 15G Feet and Miles; Pounds and Tons: Gamma 30 Metric Units (km, m, l, ml): Delta 30G Metric Units (cm, l, ml, g, kg): Gamma 30G Telling Time (hr, min): Beta 21, 23	The Symbols and Tables Page in Delta (found in both Instruction Manual and Student Workbook) includes all of the units listed in this standard. Recording measurements in two-column tables is found on Delta 30G. Note that much of this content is considered review. See the lessons listed for 3.MD.2 and 2.MD.3.
2	Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.	Application problems such as these are found throughout the curriculum once the relevant mathematical concepts have been introduced. Systematic Review and Application and Enrichment pages are excellent sources of additional word problems.	Decimals are covered in problems involving money prior to the formal introduction of decimals in Zeta. Problems involving fractions are found in Epsilon and Zeta. Multi-Step word problems involving fractions are in the Epsilon Instruction Manual Lessons 6, 12, 18, and 24. Measurement scales are found in graphing exercises. See lessons listed for 3.MD.3-4, 4.MD.4, and 2.MD.9-10.
3	Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*	Application problems such as these are found throughout the curriculum once the mathematical concept has been introduced.	Perimeter is taught in Beta and reviewed in Gamma (See lessons listed for 3.MD.8). Area is taught in Gamma (See lessons listed for 3.MD.5-7) and reviewed in Delta. Epsilon and Zeta also include area and perimeter questions using fractions and decimals.
	Represent and interpret data. (Supporting)		
4	Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*	Line Plots: Application and Enrichment Epsilon 19G	Epsilon 19G surpasses this standard by covering multiplication and division as well. See comments for 5.MD.2.

	Geometric measurement: Understand concepts of angle and measure angles. (Additional)		
5	Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:		The Delta Application and Enrichment 9G is several pages long. It includes instruction on angles, measuring angles using a protractor, and types of angles and triangles. Be sure not to skip over this. The next formal presentation of angles is not until Zeta 29.
5a	An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.	Angles: Delta 9G	
5b	An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.	Angles: Delta 9G	
6	Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.	Angles: Delta 9G	
7	Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.	Angles: Delta 9G	
4.G. – Geometry			
	Draw and identify lines and angles, and classify shapes by properties of their lines and angles. (Additional)		
1	Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.	Parallel and Perpendicular: Delta 5 Points, Lines, Rays, Line Segments: Delta 5G Right, Acute, Obtuse Angles: Delta 9G	
2	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 size. Recognize right triangles as a category, and identify right triangles.	Quadrilaterals: Delta 8G Classifying Shapes: Delta 14G Kinds of Triangles: Delta 9G	Math-U-See surpasses this standard by introducing acute and obtuse triangles as well.
3	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.	Symmetry: Delta 25G, 26G	