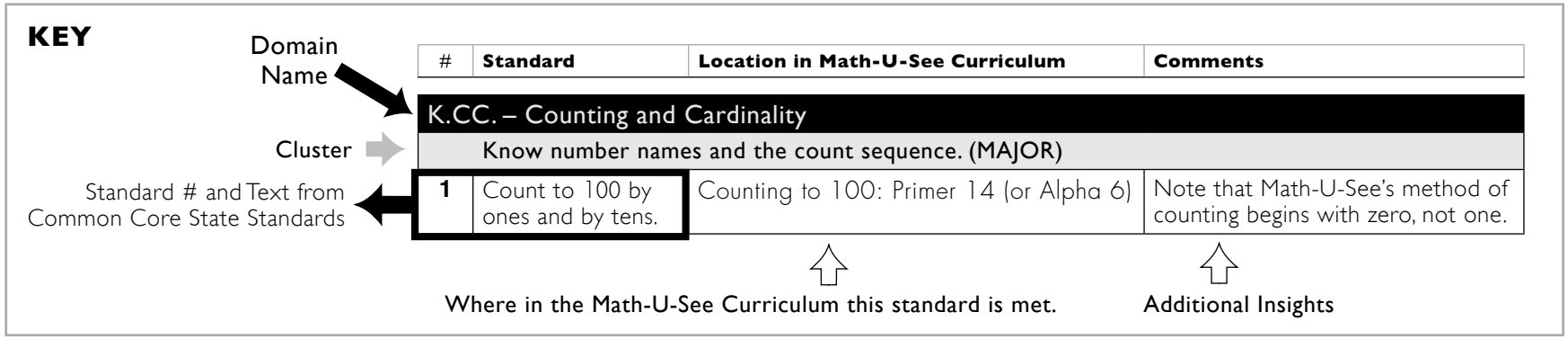
Math-U-See® Correlation with the Common Core State Standards for Mathematical Content for Third Grade

The third grade standards primarily address multiplication and division, which are covered in Math-U-See's Gamma and Delta, respectively. The use of manipulatives for visualizing multiplication and division emphasizes conceptual understanding rather than rote memorization of facts and procedures. Students truly understand the mathematical concepts while also mastering the multiplication and division facts as well as the related place-value-based strategies for multiple-digit calculations. The concept of area is also mastered while visualizing multiplication, and volume is discussed in Delta. Fractions are briefly introduced in Gamma Appendix A, although a full treatment is reserved for Epsilon. Application and Enrichment pages include graphing, classification of shapes, basic geometry, and word problems.

Be sure to utilize all of the resources available, which include the Decimal Street®/Block Clock poster, the online Worksheet Generator, and the online Math Drill.



#	Standard	Location in Math-U-See Curriculum	Comments
3.OA. – Operations and Algebraic Thinking			
	Represent and solve problems involving multiplication and division. (MAJOR)		
1	Interpret products of whole numbers, e.g., interpret 5x7 as the total number of objects in 5 groups of 7 objects each. *For example, describe a context in which a total number of objects can be expressed as 5x7.*	These concepts are presented in Gamma 1 and 2, and they are reinforced by Gamma 3–20.	Using the Math-U-See blocks as demonstrated in the Gamma Instruction Manual and on the DVD reinforces this concept visually.
2	Interpret whole-number quotients of whole numbers, e.g., interpret 56÷8 as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. *For example, describe a context in which a number of shares or a number of groups can be expressed as 56÷8.*	Rectangles, Factors, and Product: Delta 1 Symbols for Division: Delta 2 and 3	Although formal instruction of division begins in Delta, students start solving for an unknown in multiplication problems in Gamma 8. Gamma 20 includes a section of instruction on Solving for the Unknown and Division.

3	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.	Multiplication: The conceptual foundation has been laid by the end of Gamma 1 by building problems within 100 using blocks. Fluency in computation and in memorization of multiplication facts is achieved by the end of Gamma 20. Division: The conceptual foundation is laid in Gamma with solving for an unknown, but it is formally presented in Delta 1 and 2. Fluency in computation and memorization of division facts is achieved by the end of Delta 12.	Word problems begin in the Gamma Student Workbook with lesson 2 and they begin in the Delta Student Workbook with lesson 1. Arrays with multiplication are presented in Gamma Application and Enrichment 17G and 21G.
4	Determine the unknown whole number in a multiplication or division equation relating three whole numbers. *For example, determine the unknown number that makes the equation true in each of the equations 8 x ? = 48, 5 = ? ÷ 3, 6 x 6 = ?*	Solve for an Unknown in Multiplication: Gamma 8 Division as Solving for an Unknown: Gamma 20, Delta 1 Application and Enrichment: Gamma 8G, 13G, 23G, 26G	To fulfill the division portion of this standard, be sure to assign the relevant problems on Delta 8A–B, 10A–B, and 12A–B. See 3.0A.6 comments.
	Understand the properties of multiplication and the relationship between multiplication and division. (MAJOR)		
5	Apply properties of operations as strategies to multiply and divide. (Students need not use formal terms for these properties.) *Examples: If 6×4=24 is known, then 4×6=24 is also known (Commutative property of multiplication). 3×5×2 can be found by 3×5=15, then 15×2=30, or by 5×2=10, then 3×10=30 (Associative property of multiplication). Knowing that 8×5=40 and 8×2=16, one can find 8×7 as 8×(5+2)=(8×5)+(8×2)=40+16=56 (Distributive property).*	Commutative Property: Gamma 2, 4, 8 Associative Property: Gamma 24 Distributive Property: Gamma 21	For word problems that specifically reinforce this standard see Gamma Student Workbook pages 24E, 25F, 27F, 29E, and 29F.
6	Understand division as an unknown-factor problem. *For example, find 32÷ 8 by finding the number that makes 32 when multiplied by 8.*	Solving for an Unknown: Delta 1	A strength of Math-U-See is that division is presented as solving for an unknown factor. There is a section on this concept in Gamma 20 for those who will encounter it on standardized testing before reaching Delta.
	Multiply and divide within 100. (MAJOR)		
7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8x5=40, one knows 40÷5=8) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.	Multiplication: The conceptual foundation has been laid by the end of Gamma 1 by building problems within 100 using blocks. Fluency in computation and in memorization of multiplication facts is achieved by the end of Gamma 20. Division: The conceptual foundation is laid in Gamma with solving for an unknown, but it is formally presented in Delta 1 and 2. Fluency in computation and memorization of division facts is achieved by the end of Delta 12.	For math fact practice, Math-U-See offers an online Math Drill and an online Worksheet Generator.

	Solve problems involving the four operations, and identify and explain patterns in arithmetic. (MAJOR)		
8	Solve two-step word problems using the four operations. 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.	Division Multi-Step Word Problems: In addition to student workbook problems, instructions and problem banks are provided in the Delta Instruction Manual in Lessons 15, 21, and 27. Using Estimation and Common Sense to Check Word Problems: Delta 21	Multi-step word problems are given for addition in Alpha, subtraction in Beta, multiplication in Gamma, and division in Delta. Assessing the reasonableness of answers using estimation (both mental and on paper) is encouraged throughout the Math-U-See curriculum.
9	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.*	Multiplication patterns are integral to Gamma. In the student workbook, there is a fact chart to color by family. Gamma's Application and Enrichment pages include a coloring activity for each fact family, and many of the pages focus on making or finding patterns. The particular example given in the standard is covered in Gamma 16.	Addition patterns are explored in Alpha and are considered review.
	3.NBT. – Number and Operations in Base Ten		
	Use place value understanding and properties of operations to perform multi-digit arithmetic. (A range of algorithms may be used) (Additional)		
1	Use place value understanding to round whole numbers to the nearest 10 or 100.	Rounding to Tens: Beta 4 Rounding to Hundreds: Beta 11 Rounding to Thousands: Beta 17 Rounding to 10, 100, and 1,000: Gamma 22	Place value is a foundational principle in Math-U-See. Students master this standard by the end of Beta 17, and it is surpassed in Gamma by covering the thousands.
2	Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.	Reviewed in Gamma in Systematic Review pages: Quick Reviews 5D, 6D, 8D, 11D, 19D, and 20D Also Delta Quick Review 4D, 6D, and 9D	This standard is mastered in Beta. See 2.NBT.7 for the relevant lessons.
3	Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9×80, 5×60) using strategies based on place value and properties of operations.	Multiply by 10: Gamma 5 Multiples of 10: Gamma 17	
	3.NF. – Number and Operations - Fractions (Grade 3 expectations in this domain are limited to factors with denominators 2, 3, 4, 6, and 8.) (MAJOR)		
	Develop understanding of fractions as numbers.		
1	Understand a fraction 1/b as the quantity formed by 1 part when a whole is partitioned in b equal parts; understand a fraction a/b as the quantity formed by a parts of size 1/b.	More on Fractions: Appendix A in both Gamma Instruction Manual and Student Workbook Fraction of One: Epsilon 2	Additional lessons that implicitly touch on this standard include Gamma 13, Delta 27 and 29, and Epsilon 1.

2	Understand a fraction as a number on the number line; represent fractions on a number line diagram.		
2a	Represent a fraction 1/b on a number line diagram by defining the interval from 0 to 1 as the whole and partitioning it into b equal parts. Recognize that each part has size 1/b and that the endpoint of the part based at 0 locates the number 1/b on the number line.	More on Fractions: Appendix A in both Gamma Instruction Manual and Student Workbook	Number lines are formally presented in the Beta Instruction Manual and Student Workbook in Appendix B.
2b	Represent a fraction a/b on a number line diagram by marking off a lengths 1/b from 0. Recognize that the resulting interval has size a/b and that its endpoint locates the number a/b on the number line.	More on Fractions: Gamma Appendix A Application and Enrichment: Gamma A1	Number lines are formally presented in the Beta Instruction Manual and Student Workbook in Appendix B.
3	Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.		
3a	Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line.	Equivalent Fraction: Gamma 9, 13; Epsilon 4 More on Fractions: Gamma Appendix A Application and Enrichment: Gamma A1, Epsilon 30G	In Gamma, equivalent fractions are presented as series of multiples in the numerator and denominator. Epsilon 4 makes a thorough presentation in the context of lessons on fractions.
3b	Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions are equivalent, e.g., by using a visual fraction model.	Equivalent Fractions: Gamma 9, 13; Epsilon 4	In Gamma, equivalent fractions are presented as series of multiples in the numerator and denominator, and blocks can be used to illustrate them. Such fractions are treated in far greater detail in Epsilon 4, and the Math-U-See Fraction Overlays used there are a powerful tool for students to see the equivalence.
3c	Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. Examples: Express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.	More on Fractions: Gamma Appendix A Application and Enrichment: Gamma A1, Epsilon 30G	This standard is also mentioned in Epsilon 9 and applied in Epsilon Application and Enrichment 9G.
3d	Compare two fractions with the same numerator or the same denominator by reasoning about their size. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.	More on Fractions: Gamma Appendix A Application and Enrichment: Gamma A1 Comparing Fractions: Epsilon 7	This standard is covered most fully by Epsilon 7.
3.MD. –Measurement and Data			
	Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (MAJOR)		
1	Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems involving addition and subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.	Adding and Subtracting Time: Gamma 30G	Telling and writing time to the nearest minute was mastered in Alpha Appendix B or Beta 21, and the concept is considered review in Gamma. See 2.MD.7 for relevant lessons.

2	Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). (Excludes compound units such as cubic cm and finding the geometric volume of a container.) Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (Excludes multiplicative comparison problems (problems involving notions of "times as much"))	Metric Measures and Liters: Gamma 15 Metric Measures and Mass: Gamma 27 Metric Measures: Gamma Student Workbook Appendix Lesson B, Delta Application and Enrichment 30G	Math-U-See introduces in Gamma volume and mass problems with U.S. Customary units. There are an extensive number of word problems involving two quantities of the same unit. Some computation problems include metric units. In general, the metric system is treated as supplemental until its full introduction in Zeta, but suggestions are made for activities that will familiarize students with metric measures.
	Represent and interpret data. (Supporting)		
3	Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step "how many more" and "how many less" problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.	Picture Graphs: Beta 30G; Gamma 4G, 5G, 7G Bar Graphs: Beta 30, Gamma 28G, 13G	Math-U-See surpasses this standard by presenting gauges and thermometers in Beta 29 as well as an extensive coverage of line graphs in Beta 30 and Gamma 28G.
4	Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units - whole numbers, halves, or quarters.	Line Plots: Gamma Student Workbook Appendix Lesson A	
	Geometric measurement: understand concepts of area and relate area to multiplication and to addition. (MAJOR)		
5	Recognize area as an attribute of plane figures and understand concepts of area measurement.		
5a	A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and can be used to measure area.	Rectangles, Factors and Products: Gamma 1 Area of a Rectangle and a Square: Gamma 7	
5b	A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area of *n* square units.	Gamma Lesson Practice 7A and 7B	Using the blocks as described in Gamma reinforces this concept visually. The two worksheets listed make explicit the transition between blocks representing abstract numbers (e.g. 3 x 4 = 12) and units (e.g. 3 in x 4 in = 12 sq in).
6	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).	Gamma Lesson Practice 7A and 7B	Math-U-See surpasses this standard by having students count unit squares to check after computing the area.

7	Relate area to the operations of multiplication and addition.		
7a	Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.	Gamma Lesson Practice 7A and 7B	For additional problems, see the Quick Review in Delta 1D.
7b	Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.	Word problems such as these are found extensively in Gamma starting in Lesson 7.	Application and Enrichment 23G offers word problems to build different areas with the same perimeter.
7c	Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum or $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.	Multiple-Digit Multiplication: Gamma 21	Math-U-See's method of using place-value notation in multiplication of multi-digit whole numbers demonstrates the distributive property. The instruction makes the connection to area explicit, and it can be visualized by using the blocks.
7d	Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping rectangles and adding the areas of the non-overlapping parts, applying this technique to solve real world problems.	Application and Enrichment: Gamma 27G	
	Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. (Additional)		
8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.	Perimeter: Beta 15, 16G, 17G, 18G; Gamma Quick Review 13D	Perimeter is mastered in Beta and is considered review in Gamma. Many perimeter problems, both diagrams and word problems, are given in the Beta worksheets after Beta 15. To fully cover the standard, be sure to assign the perimeter problems with an unknown side found on Beta 21F and 25F.
3.G. – Geometry			
	Reason with shapes and their attributes. (Supporting)		
1	Understand that shapes in different categories (e.g. rhombuses, rectangles, and others) may share attributes (e.g., having four sides), and that the shared attributes can define a larger category (e.g., quadrilaterals). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.	Identifying Shapes: Beta Instruction Manual Appendix A Quadrilaterals: Gamma 29G, Delta 8G Classifying Shapes: Delta 14G Polygons: Delta 15G	There is also an excellent activity on Delta Application and Enrichment 7G in which students transform a parallelogram into a rectangle.
2	Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *For example, partition a shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.*	More on Fractions: Gamma Instruction Manual Appendix A and Appendix Lesson A worksheets Fraction of One: Delta 29	This standard is first broached in the Beta Instruction Manual Appendix A. Fractions are covered in detail in Epsilon.