Topic: Multiplication and Division

C2.0/CCSS Indicators – Grade 3	MCPS 2001 Indicators – Grade 3
Represent and solve problems involving multiplication and division.	
1.3.B.1 Interpret products of whole numbers, e.g., interpret 5 × 7 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 5 × 7.*	6.3.7.1 use a variety of strategies to solve simple multiplication and division problems
1.3.B.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.*	6.3.5.4 model and explain division in a variety of ways, including repeated subtraction, rectangular arrays, and by its inverse relationship to multiplication.
1.3.B.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.	6.3.5.3 model and explain multiplication in a variety of ways, including rectangular arrays and skip counting.
1.3.B.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 × ? = 48, 5 = □ ÷ 3, 6 × 6 = ?.*	
Understand properties of multiplication and the relationship between multiplication and division.	
1.3.B.5 Apply properties of operations as strategies to multiply and divide. *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.)*	6.3.6.1 model and use the identity and commutative properties for addition and multiplication to solve problems.
1.3.B.6 Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that makes 32 when multiplied by 8.*	6.3.6.2 explain and apply the concept of inverse operation as it relates to multiplication and division.
Multiply and divide within 100.	
1.3.B.7 Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that 8 × 5 = 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.	6.3.4.1 develop, use, and explain strategies to multiply and divide multiplication and division fact families.
	6.3.4.3 demonstrate mastery of multiplication facts for 0, 1, 2, 5, 10.
Solve problems involving the four operations, and identify and explain patterns in arithmetic.	
1.3.B.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.	
1.3.B.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.*	
Use place value understanding and properties of operations to perform multi-digit arithmetic.	
1.3.C.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.	
Geometric measurement: understand concepts of area and relate area to multiplication and to addition.	
2.3.A.7 Relate area to the operations of multiplication and addition.	3.3.3.4 estimate and count to find perimeter, area, and **volume** of figures and real world objects.
• 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.	
• 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.	
• 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 of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning.	
• 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.	

Topic: Fractions

C2.0/CCSS Indicators – Grade 3	MCPS 2001 indicators – Grade 3
Develop understanding of fractions as numbers. ***Grade 3 limited to denominators of 2, 3, 4, 6, 8***	
1.3.D.1 Understand a fraction $\frac{1}{b}$ as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; understand a fraction $\frac{a}{b}$ as the quantity formed by *a* parts of size $\frac{1}{b}$.	6.3.1.2 represent fractions and mixed numbers using numerals and a variety of models.
1.3.D.2 Understand a fraction as a number on the number line; represent fractions on a number line diagram. • Represent a fraction $\frac{1}{b}$ 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 $\frac{1}{b}$ and that the endpoint of the part based at 0 locates the number $\frac{1}{b}$ on the number line. • Represent a fraction $\frac{a}{b}$ on a number line diagram by marking off *a* lengths $\frac{1}{b}$ from 0. Recognize that the resulting interval has size $\frac{a}{b}$ and that its endpoint locates the number $\frac{a}{b}$ on the number line.	1.3.4.1 plot points to represent whole numbers and fractions with denominators of 2,3, and 4 on a number line.
1.3.D.3 Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size. • Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number line. • Recognize and generate simple equivalent fractions, e.g., $\frac{1}{2}=\frac{2}{4}, \frac{4}{6}=\frac{2}{3}$. Explain why the fractions are equivalent, e.g., by using a visual fraction model. • Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Examples: Express 3 in the form* $3=\frac{3}{1}$*; recognize that* $\frac{6}{1}=6$*; locate* $\frac{4}{4}$ *and 1 at the same point of a number line diagram.* • 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.	6.3.2.1 identify equivalent fractions using models and pictures.
Represent and interpret data. 2.3.A.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.	
Reason with shapes and their attributes. 3.3.A.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* $\frac{1}{4}$ *of the area of the shape.*	