Topic C

Multiplication and Division Using Units up to 8

3.OA.3, 3.OA.4, 3.OA.5, 3.OA.7, 3.OA.1, 3.OA.2, 3.OA.6, 3.OA.8

Focus Standards:	3.OA.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.
	3.OA.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 = ?*
	3.OA.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.)*
	3.OA.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.
Instructional Days:	4	
Coherence -Links from:	G2–M3	Place Value, Counting, and Comparison of Numbers to 1,000
	G2–M6	Foundations of Multiplication and Division
	G3–M1	Properties of Multiplication and Division and Solving Problems with Units of 2–5 and 10
-Links to:	G3–M4	Multiplication and Area
	G4–M3	Multi-Digit Multiplication and Division
	G4–M5	Fraction Equivalence, Ordering, and Operations
	G4–M7	Exploring Measurement with Multiplication

Students are informally familiar with parentheses from having seen them in distributive property lessons in Topic B and in Module 1. In Lesson 8, they understand parentheses as tools for grouping and learn the conventional order for performing Grade 3 operations. This practice anticipates applying parentheses in Lesson 9 as students formally study the associative property.

In Lesson 9, students model and demonstrate how to multiplicatively compose or decompose to make problems using units up to 8 easier to solve. For example, 8 × 5 may be thought of as:

$$8 \times 5 = (4 \times 2) \times 5$$
$$= 4 \times (2 \times 5)$$
$$= 4 \times 10$$

Lessons 10 and 11 in this topic parallel Lessons 6 and 7 in Topic B. In Lesson 10, students use the 5 + n pattern as a strategy for solving multiplication and division problems using units of 8 with the distributive property. They learn that multiples of 8 can be thought of as (5 + 3) × n. In division problems, students practice decomposing the dividend using multiples of 5. They recognize the efficacy of using this strategy when the quotient of a division equation is greater than 5 and also realize that the dividend must be decomposed into numbers that are divisible by the divisor. For example, to solve 64 ÷ 8, 64 can be decomposed as 40 and 24 because both are divisible by 8.

In Lesson 11, students analyze, model, and solve multiplication and division word problems using units of 8. They understand division as both a quantity divided into equal groups, as well as an unknown factor problem. They draw models and write equations to interpret and solve problems, using a letter to represent the unknown in various positions.

A Teaching Sequence Toward Mastery of Multiplication and Division Using Units up to 8
Objective 1: Understand the function of parentheses and apply to solving problems. (Lesson 8)
Objective 2: Model the associative property as a strategy to multiply. (Lesson 9)
Objective 3: Use the distributive property as a strategy to multiply and divide. (Lesson 10)
Objective 4: Interpret the unknown in multiplication and division to model and solve problems. (Lesson 11)