3 GRADE

Mathematics Curriculum

Topic E

Analysis of Patterns and Problem Solving Including Units of 0 and 1

3.OA.3, **3.OA.7, 3.OA.8, 3.OA.9**, 3.OA.1, 3.OA.2, 3.OA.4, 3.OA.6

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.7	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$, one knows $40 \div 5 = 8$) or properties of operations. By the end of Grade 3, know from memory all products of two one-digit numbers.
	3.OA.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. (This standard is limited to problems posed with whole numbers and having whole-number answers; students should know how to perform operations in the conventional order when there are no parentheses to specify a particular order, i.e., Order of Operations.)
	3.OA.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*.
Instructional Days:	3	
Coherence -Links from:	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–M7	Exploring Measurement with Multiplication

In Lesson 16, students multiply and divide by 0 and 1. They use patterns to understand that $n \times 0 = 0$ and show why the result of dividing a number by 0 is undefined but that dividing 0 by another number results in 0. Lesson 17 synthesizes students' knowledge of factors from 0 to 10 in an exploration of patterns using the multiplication table. Students recognize the patterns of particular factors and make connections between multiplication and division.

In Lesson 18, students apply the tools, representations, and concepts they have learned in order to solve two-step word problems using all four operations. They call on rounding skills learned in Module 2 to estimate solutions and use their estimations to assess the reasonableness of answers.

A Teaching Sequence Toward Mastery of Analysis of Patterns and Problem Solving Including Units of 0 and 1
Objective 1: Reason about and explain arithmetic patterns using units of 0 and 1 as they relate to multiplication and division. (Lesson 16)
Objective 2: Identify patterns in multiplication and division facts using the multiplication table. (Lesson 17)
Objective 3: Solve two-step word problems involving all four operations and assess the reasonableness of solutions. (Lesson 18)

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