Topic D

Fraction Expressions and Word Problems

5.OA.1, 5.OA.2, 5.NF.4a, 5.NF.6

Focus Standard:	5.OA.1	Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
	5.OA.2	Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 +7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.*
	5.NF.4a	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. a. Interpret the product of *(a/b) × q* as *a* parts of a partition of *q* into *b* equal parts; equivalently, as the result of a sequence of operations *a × q ÷ b. For example, use a visual fraction model to show (2/3 × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)*
	5.NF.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
Instructional Days:	3	
Coherence -Links from:	G4–M2	Unit Conversions and Problem Solving with Metric Measurement
-Links to:	G6–M2	Arithmetic Operations Including Division of Fractions

Interpreting numerical expressions opens Topic D as students learn to evaluate expressions with parentheses, such as $3 \times (\frac{2}{3} - \frac{1}{5})$ or $\frac{2}{3} \times (7 + 9)$ (**5.OA.1**). They then learn to interpret numerical expressions, such as *3 times the difference between* $\frac{2}{3}$ *and* $\frac{1}{5}$ or *two thirds the sum of 7 and 9* (**5.OA.2**). Students generate word problems that lead to the same calculation (**5.NF.4a**) such as, "Kelly combined 7 ounces of carrot juice and 5 ounces of orange juice in a glass. Jack drank $\frac{2}{3}$ of the mixture. How much did Jack drink?" Solving word problems (**5.NF.6**) allows students to apply new knowledge of fraction multiplication in context, and tape diagrams are used to model multi-step problems requiring the use of addition, subtraction, and multiplication of fractions.

A Teaching Sequence Toward Mastery of Fraction Expressions and Word Problems	
Objective 1:	**Compare and evaluate expressions with parentheses. (Lesson 10)**
Objective 2:	**Solve and create fraction word problems involving addition, subtraction, and multiplication. (Lessons 11–12)**