Topic D

Fraction Expressions and Word Problems

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

Focus Standards:

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 × (2/3 − 1/5) or 2/3 × (7 + 9) (5.OA.1). They then learn to interpret numerical expressions, such as 3 times the difference between 2/3 and 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 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)