Topic C

Multiplication of a Whole Number by a Fraction

**5.NF.4a**

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| Focus Standard: | 5.NF.4a | Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.1. 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.)*
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| Instructional Days: | 4 |   |
| Coherence -Links from: | G4–M5 | Fraction Equivalence, Ordering, and Operations |
|  -Links to: | G6–M2 | Arithmetic Operations Including Division of Fractions |

In Topic C, students interpret finding a fraction of a set ($\frac{3}{4}$ *of* 24) as multiplication of a whole number by a fraction ($\frac{3}{4}$ × 24) and use tape diagrams to support their understandings (**5.NF.4a**). This, in turn, leads students to see division by a whole number as being equivalent to multiplication by its reciprocal. That is, division by 2, for example, is the same as multiplication by $\frac{1}{2}$.

Students also use the commutative property to relate fraction of a set to the Grade 4 repeated addition interpretation of multiplication by a fraction. This offers opportunities for students to reason about various strategies for multiplying fractions and whole numbers. Students apply their knowledge of fraction of a set and previous conversion experiences (with scaffolding from a conversion chart, if necessary) to find a fraction of a measurement, thus converting a larger unit to an equivalent smaller unit (e.g., $\frac{1}{3}$ min = 20 seconds and $2\frac{1}{4}$ feet = 27 inches).

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| A Teaching Sequence Toward Mastery of Multiplication of a Whole Number by a Fraction |
| Objective 1: Relate fractions as division to fraction of a set.(Lesson 6) |
| Objective 2: Multiply any whole number by a fraction using tape diagrams.(Lesson 7) |
| Objective 3: Relate a fraction of a set to the repeated addition interpretation of fraction multiplication.(Lesson 8) |
| Objective 4: Find a fraction of a measurement, and solve word problems.(Lesson 9) |