5.NF.B.4.A: Interpret Fraction Multiplication as Multiple Parts of a Whole

**Common Core Domain:** Numbers & Operations - Fractions

**Common Core Cluster:** Apply and Extend Previous Understandings of Multiplication and division to Multiply and Divide Fractions

**Standard (with text below): 5.NF.B.4.A**

Apply and extend previous understandings of multiplication to multiply a [fraction](javascript:showTip('fraction','A%20number%20expressible%20in%20the%20form%20a/b%20where%20a%20is%20a%20whole%20number%20and%20b%20is%20a%20positive%20whole%20number.%20(The%20word%20fraction%20in%20these%20standards%20always%20refers%20to%20a%20non-negative%20number.)%20See%20also:%20rational%20number.')) or [whole number](javascript:showTip('whole%20number','The%20numbers%200,%201,%202,%203,%20%E2%80%A6.')) by a fraction. Interpret the product (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](javascript:showTip('visual%20fraction%20model','A%20tape%20diagram,%20number%20line%20diagram,%20or%20area%20model.')) 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.)

**MAIN CONCEPTS**

* Express Division of a whole number as multiplication of a whole number by the unit fraction (7 4 = 7 x ¼ = 7/4)
* Express the fraction of a fraction as a fraction times a fraction (1/3 of ½ = 1/6 by modeling that dividing ½ into 3 equal parts, then divide the other half into 3 parts, 6 parts make one whole so 1/3 of ½ = 1/6).
* Develop understanding that the formula for the product of 2 fractions is a/b x c/d = ac/bd.
* Use fraction strip and number lines to model fraction multiplication.

**TESTING FOCUS:**

**5.NF.B.4.A** IS SUBJECT TO TYPE I QUESTIONS ON THE PARCC ASSESSMENT

**Clarifications, limits, emphases, and other information intended to ensure**

**appropriate variety in tasks:**

* Tasks require finding a fractional part of a whole number quantity
* Tasks have “thin context” or no context.
* Tasks require finding a product of two fractions (neither of the factors equal to a whole number).

**Relationship to Mathematical Practices**

* [CCSS.MATH.PRACTICE.MP7](http://www.corestandards.org/Math/Practice/MP7/) Look for and make use of structure

**Additional Resources:**

* Progressions for Common Core Mathematics: [3-5 Number and Operations – Fractions](http://mathematicalmusings.org/wp-content/uploads/2018/08/ccss_progression_nf_35_2018_08_10.pdf)
* [IXL](https://www.ixl.com/standards/common-core/math/grade-5) – see main concepts and hover over each to see example problems
* [Khan Academy](https://www.khanacademy.org/math/arithmetic/fraction-arithmetic/arith-review-add-sub-fractions/v/visually-adding-fractions-with-unlike-denominators): There are 6 additional videos and practice links to the left that are all applicable for adding and subtracting fractions with unlike denominators.
* [OJUSD](https://ojusd-ca.schoolloop.com/pf4/cms2/view_page?d=x&group_id=1412232636067&vdid=i24b1tyjgb7s): Video that shows how students can work through solving problems to add and subtract fractions with unlike denominators.
* [Grade 5 Eureka Essentials (Teacher lesson google doc)](https://docs.google.com/document/d/1XT82a9U58vwLEw6ZOyTN4nteZnCvkCWH2j75CiPXQtk/edit#heading=h.uw1rw11tpbn5): Go to pages 32-43.
  + [Application problems from lesson](https://www.k-5mathteachingresources.com/support-files/closest-to-25.pdf)
* [K-5 Math Teaching Resources](https://www.k-5mathteachingresources.com/support-files/closest-to-25.pdf): Simple dice game
* Standards For Mathematical Practice : <http://www.corestandards.org/Math/Practice/>