Standard 4.NF.4 Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

> **a.** Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equation 5/4 = 5 x (1/4).
>
> **b.** Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 x (2/5) as 6 x (1/5), recognizing this product as 6/5. (In general, n x (a/b) = (n x a)/b).
>
> **c.** Solve word problems involving multiplication of a fraction by a whole number (for example, by using visual fraction models and equations to represent the problem). For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be five people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

Please Note: Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers (Standards 4.NF.3–4).

Denominators for fourth grade are limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100.

Key Elements: When multiplying a fraction by a whole number the denominator maintains the same, yet the numerator represents the product.

Drawings: 5/4 as the product 5 x (1/4) $5 \times 14 = 51 \times 14 = 5 \times 11 \times 4 = 54$

3 x (2/5) as 6 x (1/5) The orange shows 2/5 shaded, yellow shows 2/5 shaded, and the green shows 2/5 shaded. When you add the orange, yellow and green together you get 6/5
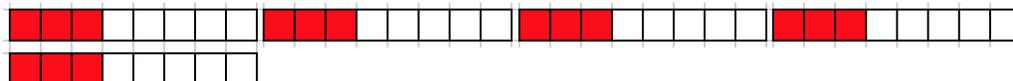

3 X 2/5

Repeated Addition: Making the connection between multiplying with whole numbers as repeated addition is the same as multiplying a fraction with a whole number. This shows 5 groups of ¼ or ¼ added 5 times.

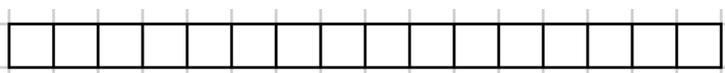5 x (1/4) = 1/4 + 1/4 + 1/4 + 1/4 + 1/4   = 5/4

Bar Model: This model shows 5 wholes with 3/8 of each whole shaded.

3/8   **+**   **3/8**   **+**   **3/8**   **+**   **3/8**   **+**   **3/8**
=   15/8

3/8   3/8   3/8   3/8   3/8

3/8 x 5 = 15/8   or   3/8 x 5 = 1 7/8

Number Line:

Word Problem:
If each person at a party will eat 3/8 of a pound of roast beef, and there will be five people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

3/8 + 3/8 + 3/8 + 3/8 + 3/8 = 15/8

15/8 = 8/8 + 7/8 = 1 $\frac{7}{8}$ **See above for what two whole number does your answer lie.**