

**Standard 5.NF.6** Solve real-world problems involving multiplication of fractions and mixed numbers, for example, by using visual fraction models or equations to represent the problem.

**Please Note:** Apply and extend previous understandings of multiplication and division to multiply and divide fractions (Standards 5.NF.3–7).

**Key Elements:** Students should be able to use solve real life situations dealing with fractions and mixed numbers using models and equations to show their understanding.

\*For a more in depth overview of multiplying with fractions, [see standard 5.NF.5](#).

Area Model:

The area model for this is done by creating an area to represent the whole. One of the factors is present on the top side of the model. The fraction is represented as going vertically down the box. The second factor is placed on the side and, in a different color, is represented as going horizontally across the box. The space where the two boxes meet is the product. I.e. the fractional part of the fraction. (insert models1)

Number Line:

There are two ways to represent multiplication on the number line. The first way is where one of the factors is placed on the number line. The second factor then is used to divide each of the fractional pieces of the original denominator into that number of pieces while circling the number of pieces in the numerator. These circled portions are then put together (either just by adding them up or actually re-circling them on the number line) to provide you with the product. Remember, the answer in multiplication is always referring to the original whole. (insert models2)

The second representation may be more easily described as a comparison method, but does a great job of showing the scaling idea. You identify the first factor and place it on the number line. A second, temporary number line is placed below it that matches the size of the first factor. That line is then segmented according to the second factor. This then shows you the product, though it may not tell you the denominator of the answer (hence why it is good at showing the concept, but not finding the answer). To do so it would require the student to find what the denominator is through understanding the multiplicative relationship between the two original denominators. (insert models3)