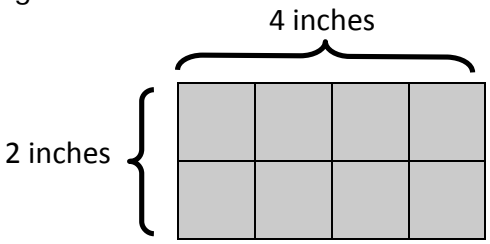
Multiplying Fractions
Another Approach

The procedure for multiplying fractions is to multiply the numerators and multiply the denominators as shown below.

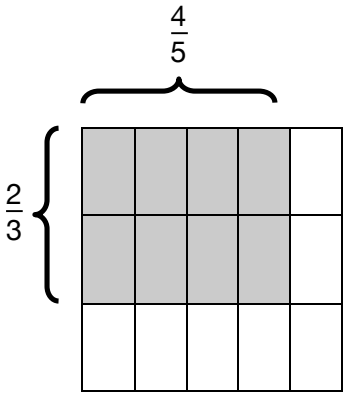
$$\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$$

Students who memorize this procedure without understanding why it works often have difficulty knowing when to use the procedure and have difficulty recognizing a reasonable answer. By drawing a diagram, you can develop an understanding of the problem situation, an understanding of the procedure, and a sense of what is a reasonable answer.

A rectangular region is a good model to represent multiplication of whole numbers and multiplication of fractions. You find the area of a rectangle by multiplying the width times the length. A rectangle that measures 2 inches by 4 inches has an area of 8 square inches. You can represent 2 x 4 with the following rectangle.



You can represent two thirds times four fifths with the shaded rectangular region shown below. The square represents one square unit. There are eight shaded parts and each part is equal to one fifteenth, so $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$.



There are two rows of shaded parts with four in each row. Multiplying the numerators, 2 x 4, tells you the number of shaded parts. The unit square is made up of three rows with five parts in each row. Multiplying the denominators, 3 x 5, tells you the number of parts in the unit, so each part is one fifteenth. The shaded region represents eight fifteenths. The purpose of representing problems with a diagram is to develop understanding of what it means to multiply fractions. Once students understand, it makes sense to solve problems with an accurate and efficient procedure.