Multiplication of Fractions

In considering multiplication of fractions, remember that multiplication is a shortcut for repeated addition.

When we have something like $3\times\frac{2}{5}$, what we're really saying is "we have three $\frac{2}{5}$s added together", or $\frac{2}{5}+\frac{2}{5}+\frac{2}{5}=\frac{6}{5}$.

• Write the following as addition problems and then simplify:

1) $4\times\frac{1}{7}$ 2) $3\times\frac{2}{9}$ 3) $5\times\frac{3}{8}$

Many teachers and books teach the shortcut. Remember that many shortcuts in mathematics came about because someone did problems the "long way" and noticed a pattern. What pattern do you notice if you compare the answers to the above problems to the problems themselves? _____
_____

One thing to keep in mind is that the "understood" denominator for a whole number is "1". So, we can write 4 as $\frac{4}{1}$, 3 as $\frac{3}{1}$, and 5 as $\frac{5}{1}$.

The natural question that comes out of this is "Does this pattern work for all fractions or just those where one of them is a whole number?"

Let's examine a few other cases and then we'll look at multiplication in terms of area of rectangles.

What does "$\frac{1}{2}$ of $\frac{2}{5}$" mean? Well, if we have 2 fifths, and I take half, how much do I have?_____

"Of" is a word that is generally associated with multiplication. Using fraction pieces, we can show multiplication of fractions.

1) What is $\frac{1}{3}$ of $\frac{6}{8}$? (This is the same as asking "If I divide 6 eighths into 3 groups, and then take one of those groups, how much do I have?)

2) What is $\frac{3}{4}$ of $\frac{4}{5}$? (This is the same thing as asking "If I divide 4 fifths into 4 groups, and then take three of those groups, how much do I have?)

Using the pattern you found on the other page, see if you get the same thing. You should! (Don't forget to simplify your answers!)

1) $\frac{1}{3}\times\frac{6}{8}$

2) $\frac{3}{4}\times\frac{4}{5}$

There's another way we can look at multiplication of fractions that involves area of rectangles, and we'll look at that next.