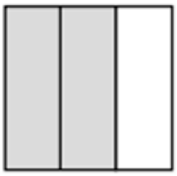
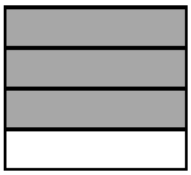
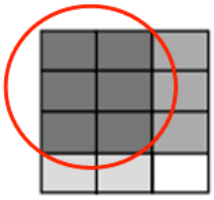
Multiplying Fractions!

It is important to understand what is happening when you multiply fractions. These models help to show what is happening.

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

First, separate the square into 3 equal parts vertically. Shade 2 parts to show 2/3. 	Now separate the square into 4 equal parts horizontally. Shade 3 parts to show 3/4. 
Put the two shaded squares together to multiply them. Since we are looking for 2/3 x 3/4, or 2/3 of 3/4, we get 6 out of 12 parts that are double-shaded. So 2/3 x 3/4 = 6/12. 	Remember that the word "of" and the multiplication sign mean the same thing. $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$ **or** 2/3 *of* 3/4 *is* 6/12

Multiplying (using just the numbers)

* Multiply the tops. Multiply the bottoms.

$$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$$

In other words: $2 \times 3 = 6$

$3 \times 4 = 12$

When Would You Multiply a Fraction Times a Fraction

- Your family eats 1/8 of 1/2 of a left over wedding cake.

1/8 of 1/2 or 1/8 x 1/2

When Would You Multiply a Fraction Times a Fraction

- Jose had already read 1/2 of his novel. Today he read 1/12 of the 1/2 left. How much of the book has he read?

1/12 of 1/2 or 1/12 x 1/2

Multiplying Fractions Conceptual Understanding

- When you multiply two fractions that are between 0 and 1 the **product** is smaller than both fractions.

$\frac{1}{2} \times \frac{3}{4} = 3/8$

How to Find a Fraction of a Fraction

- The first thing to remember is **"of"** means multiply in mathematics.

of = x

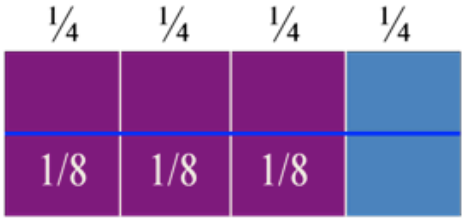
The following slides will tell you how many tiles to get. Make sure that you have two sets of colors. You can use colored paper for tiles. The tiles are the second fraction of the problem.

To get the first fraction, lay a string (or more) across the tiles to make the pieces. For example, ½ would need one string to "cut" the tiles into two parts (the number at the bottom of the fraction, the *denominator*).

The answers for the problems are at the end.
The circles show how the tiles can be regrouped to simplify the fraction.

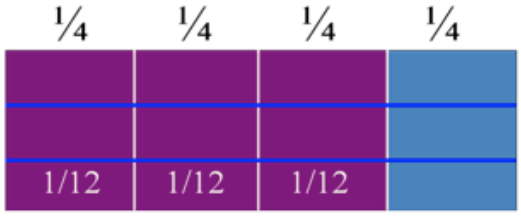
1. **Get three tiles of one color and one tile of another color.**

$\frac{1}{2}$ of $\frac{3}{4} =$ ☐



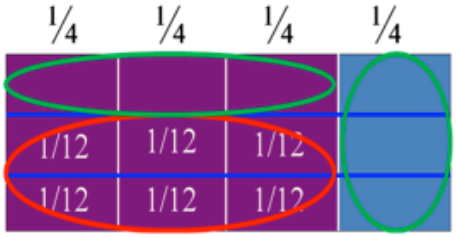
2. **Get three tiles of one color and one tile of another color.**

$1/3$ of $3/4 =$ ☐



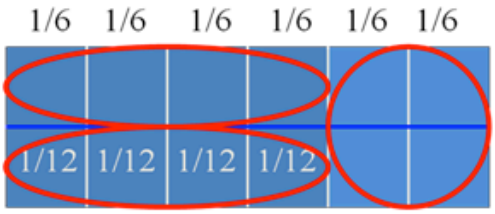
3. **Get three tiles of one color and one tile of another color.**

$2/3$ of $3/4 =$ ☐ $= 1/2$



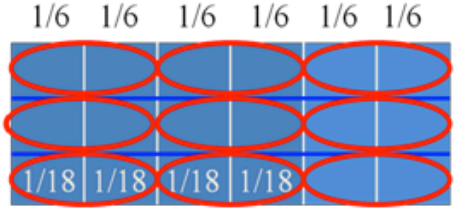
4. **Get four tiles of one color and two tiles of another color.**

$1/2$ of $4/6 =$ ☐ $= 1/3$



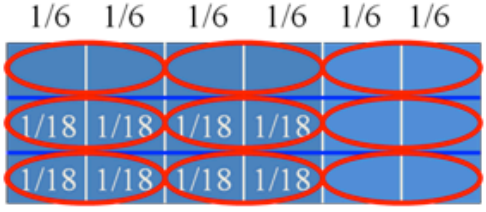
5. **Get four tiles of one color and two tiles of another color.**

$1/3$ of $4/6 =$ ☐ $= 2/9$



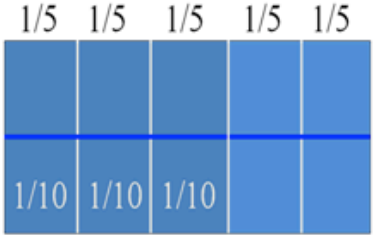
6. **Get four tiles of one color and two tiles of another color.**

$2/3$ of $4/6 =$ ☐ $= 4/9$



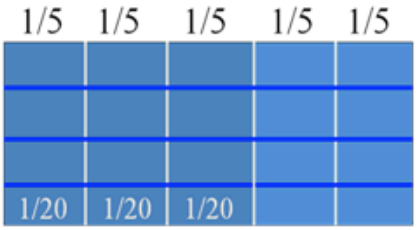
7. **Get three tiles of one color and two tiles of another color.**

$1/2$ of $3/5 =$ ☐



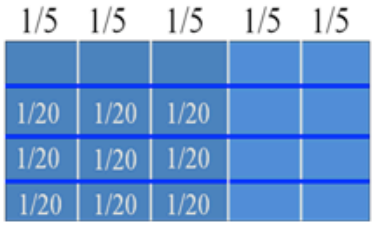
8. **Get three tiles of one color and two tiles of another color.**

$1/4$ of $3/5 =$ ☐



9. **Get three tiles of one color and two tiles of another color.**

$3/4$ of $3/5 =$ ☐



Answers:

1. 1/2 of 3/4 = 1/2 x 3/4 = 3/8
2. 1/3 of 3/4 = 1/3 x 3/4 = 3/12
3. 2/3 of 3/4 = 2/3 x 3/4 = 6/12 which can be simplified to 1/2 *(divide 6/12 by 6/6)*
4. 1/2 of 4/6 = 1/2 x 4/6 = 4/12 which can be simplified to 1/3 *(divide 4/12 by 4/4)*
5. 1/3 of 4/6 = 1/3 x 4/6 = 4/18 which can be simplified to 2/9 *(divide 4/18 by 2/2)*
6. 2/3 of 4/6 = 2/3 x 4/6 = 8/18 which can be simplified to 4/9 *(divide 8/18 by 2/2)*
7. 1/2 of 3/5 = 1/2 x 3/6 = 3/12 which can be simplified to 1/4 *(divide 3/12 by 3/3)*
8. 1/4 of 3/5 = 1/4 x 3/5 = 3/20
9. 3/4 of 3/5 = 3/4 x 3/5 = 9/20