October 20, 2015 Math 6 Lesson 2.1

Learning Objective: Students will be able to use a visual model and a formal process for multiplying fractions.

Warm Up

$$\begin{array}{r} 34 \\ \times\, 62 \\ \hline \end{array} \qquad \begin{array}{r} 70 \\ \times\, 67 \\ \hline \end{array} \qquad \begin{array}{r} 54 \\ \times\, 70 \\ \hline \end{array}$$

$$\begin{array}{r} 18 \\ \times\, 52 \\ \hline \end{array} \qquad \begin{array}{r} 79 \\ \times\, 69 \\ \hline \end{array} \qquad \begin{array}{r} 29 \\ \times\, 45 \\ \hline \end{array}$$

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Warm Up Answers

34	70	54
× 62	× 67	× 70
68	490	0
2,040	4,200	3,780
2,108	4,690	3,780

18	79	29
× 52	× 69	× 45
36	711	145
900	4,740	1,160
936	5,451	1,305

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Essential Question:

What does it mean to multiply fractions?

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Lesson Objective:

Students will be able to:

use a visual model and a formal process for multiplying fractions.

Self-Evaluation Scale

Score	Description
4	I can teach other students how to use a visual model and a formal process for multiplying fractions.
3	I can use a visual model and a formal process for multiplying fractions.
2	I recognize, but still need help to use a visual model and a formal process for multiplying fractions.
1	I do not know how to use a visual model and a formal process for multiplying fractions.

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Activity 1

With a partner, work on Activity 1 on pages 31 of your Big Ideas Record and Practice Journal.

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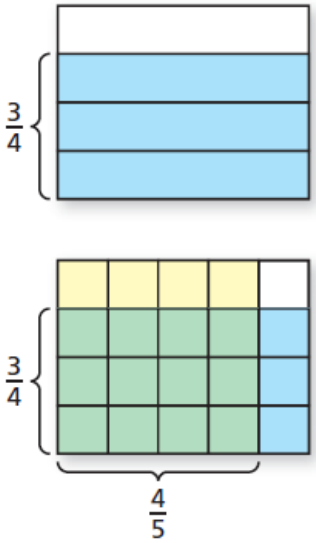
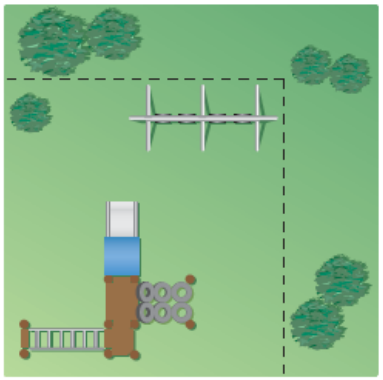
2 ACTIVITY: Multiplying Fractions



Work with a partner. A park has a playground that is $\frac{3}{4}$ of its width and $\frac{4}{5}$ of its length. What fraction of the park is covered by the playground?



Fold a piece of paper horizontally into fourths and shade three of the fourths to represent $\frac{3}{4}$.

Fold the paper vertically into fifths and shade $\frac{4}{5}$ of the paper another color.

Count the total number of squares. This number is the denominator. The numerator is the number of squares shaded with both colors.

$\therefore \frac{3}{4} \times \frac{4}{5} = \frac{\square}{\square} = \frac{\square}{\square}$. So, $\frac{\square}{\square}$ of the park is covered by the playground.

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IN YOUR OWN WORDS What does it mean to multiply fractions?

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Key Idea

Multiplying Fractions

Words Multiply the numerators and multiply the denominators.

Numbers $\frac{3}{7} \times \frac{1}{2} = \frac{3 \times 1}{7 \times 2} = \frac{3}{14}$

Algebra $\frac{a}{b} \cdot \frac{c}{d} = \frac{a \cdot c}{b \cdot d}$, where $b, d \neq 0$

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1 Multiplying Fractions

Find $\frac{1}{5} \times \frac{1}{3}$.

$$\frac{1}{5} \times \frac{1}{3} = \frac{1 \times 1}{5 \times 3}$$

Multiply the numerators.

Multiply the denominators.

$$= \frac{1}{15}$$

Simplify.

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2 Multiplying Fractions with Common Factors

Find $\frac{8}{9} \times \frac{3}{4}$.

Estimate $1 \times \frac{3}{4} = \frac{3}{4}$

$$\frac{8}{9} \times \frac{3}{4} = \frac{8 \times 3}{9 \times 4}$$

Multiply the numerators.

Multiply the denominators.

$$= \frac{\overset{2}{\cancel{8}} \times \cancel{3}^{1}}{\cancel{9}_{3} \times \cancel{4}_{1}}$$

Divide out common factors.

$$= \frac{2}{3}$$

Simplify.

∴ The product is $\frac{2}{3}$.

Reasonable? $\frac{2}{3} \approx \frac{3}{4}$ ✓

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On Your Own

Multiply. Write the answer in simplest form.

1. $\frac{1}{2} \times \frac{5}{6}$

2. $\frac{7}{8} \times \frac{1}{4}$

3. $\frac{3}{7} \times \frac{2}{3}$

4. $\frac{4}{9} \times \frac{3}{10}$

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4 Multiplying a Fraction and a Mixed Number

Find $\frac{1}{2} \times 2\frac{3}{4}$.

Estimate $\frac{1}{2} \times 3 = 1\frac{1}{2}$

$\frac{1}{2} \times 2\frac{3}{4} = \frac{1}{2} \times \frac{11}{4}$ Write $2\frac{3}{4}$ as the improper fraction $\frac{11}{4}$.

$= \frac{1 \times 11}{2 \times 4}$ Multiply the numerators and the denominators.

$= \frac{11}{8}$, or $1\frac{3}{8}$ Simplify.

∴ The product is $1\frac{3}{8}$.

Reasonable? $1\frac{3}{8} \approx 1\frac{1}{2}$ ✓

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5 Multiplying Mixed Numbers

Find $1\frac{4}{5} \times 3\frac{2}{3}$.

Estimate $2 \times 4 = 8$

$1\frac{4}{5} \times 3\frac{2}{3} = \frac{9}{5} \times \frac{11}{3}$ Write $1\frac{4}{5}$ and $3\frac{2}{3}$ as improper fractions.

$= \frac{\overset{3}{\cancel{9}} \times 11}{5 \times \underset{1}{\cancel{3}}}$ Multiply fractions. Divide out the common factor 3.

$= \frac{33}{5}$, or $6\frac{3}{5}$ Simplify.

∴ The product is $6\frac{3}{5}$.

Reasonable? $6\frac{3}{5} \approx 8$ ✓

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On Your Own

Multiply. Write the answer in simplest form.

6. $\frac{1}{3} \times 1\frac{1}{6}$

7. $3\frac{1}{2} \times \frac{4}{9}$

8. $1\frac{7}{8} \times 2\frac{2}{5}$

9. $5\frac{5}{7} \times 2\frac{1}{10}$

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Assignment

Complete problems 8, 14, 18, 19, 35, 39, 40, 41, 54, 55, & 58 on pages 59 - 61 in your Big Ideas Text Book.

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Essential Question:

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Homework

In your Big Ideas Record and Practice Journal page 34.