

## 2.1 Multiplying Fractions

### ESSENTIAL QUESTION

How do you multiply fractions?

### COMMON CORE STATE STANDARDS

6.NS.1 Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions.

#### EXAMPLE 1 Multiplying Fractions

Multiply. Write in simplest form.

$$\frac{1}{5} \cdot \frac{1}{3} = \frac{1}{15}$$

#### EXAMPLE 1 Multiplying Fractions

Multiply. Write in simplest form.

$$\frac{8}{9} \cdot \frac{3}{4} = \frac{2}{3}$$

#### EXAMPLE 1 Multiplying Fractions

Multiply. Write in simplest form.

$$\frac{3}{8} \cdot 12 = \frac{9}{2}$$

### ● On Your Own

Multiply. Write the answer in simplest form.

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

$$\frac{1}{2} \cdot \frac{5}{6} = \frac{10}{12}$$

### ● On Your Own

Multiply. Write the answer in simplest form.

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

$$\frac{7}{8} \cdot \frac{1}{4} = \frac{7}{32}$$

### ● On Your Own

Multiply. Write the answer in simplest form.

3.  $\frac{2}{7} \cdot \frac{2}{3} = \frac{2}{7}$

### ● On Your Own

Multiply. Write the answer in simplest form.

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

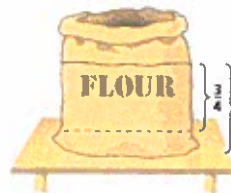
$$\frac{4}{9} \cdot \frac{3}{10} = \frac{2}{15}$$

When multiplying fractions, multiply the numerators and denominators (multiply straight across). Then simplify if necessary.

You can divide out common factors if you recognize them first before multiplying straight across

### EXAMPLE 3 Real-Life Application

You have  $\frac{2}{3}$  of a bag of flour. You use  $\frac{3}{4}$  of the flour to make empanada dough. How much of the entire bag do you use to make the dough?



To find  $\frac{3}{4}$  of  $\frac{2}{3}$  multiply

$$\frac{3}{4} \cdot \frac{2}{3} = \frac{6}{12} = \frac{1}{2}$$

You use  $\frac{1}{2}$  of the entire bag

Bounce the ball. To change the mixed number to an improper fraction, multiply whole number times denominator. Then add product to numerator. Write sum over original denominator.

**EXAMPLE 4** Multiplying a Fraction and a Mixed Number

Multiply. Write in simplest form.

$$\frac{1}{2} \cdot 2\frac{3}{4}$$

$$\frac{1}{2} \cdot \frac{2 \times 4 + 3}{4}$$

$$\frac{1}{2} \cdot \frac{11}{4}$$

$$\frac{11}{8} \text{ or } 1\frac{3}{8}$$

**EXAMPLE 4** Multiplying a Fraction and a Mixed Number

Multiply. Write in simplest form.

$$1\frac{4}{5} \cdot 3\frac{2}{3}$$

$$1\frac{4}{5} \cdot 3\frac{2}{3}$$

$$\frac{9}{5} \cdot \frac{11}{3} = \frac{33}{5}$$

or

$$6\frac{3}{5}$$

**On Your Own**

Multiply. Write in simplest form.

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

$$\frac{1}{3} \cdot 1\frac{1}{6}$$

$$\frac{1}{3} \cdot \frac{7}{6} = \frac{7}{18}$$

**On Your Own**

Multiply. Write in simplest form.

$$2. 3\frac{1}{2} \cdot \frac{4}{9}$$

$$3\frac{1}{2} \cdot \frac{4}{9}$$

$$\frac{7}{2} \cdot \frac{4}{9} = \frac{14}{9}$$

or

$$1\frac{5}{9}$$

**On Your Own**

Multiply. Write in simplest form.

$$3. 1\frac{7}{8} \cdot 2\frac{2}{5}$$

$$1\frac{7}{8} \cdot 2\frac{2}{5}$$

$$\frac{11}{8} \cdot \frac{12}{5} = \frac{132}{40} = \frac{33}{10} = 3\frac{3}{10}$$

or

**On Your Own**

Multiply. Write in simplest form.

$$4. 5\frac{5}{7} \cdot 2\frac{1}{10}$$

$$5\frac{5}{7} \cdot 2\frac{1}{10}$$

$$\frac{40}{7} \cdot \frac{21}{10} = 12$$

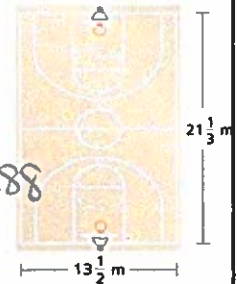
When multiplying MIXED NUMBERS, write each mixed number as an improper fraction (bounce the ball). Then multiply as you would with fractions. Simplify if necessary.

**EXAMPLE 6** Real-Life Application

A city is resurfacing a basketball court. Find the area of the court.

$$21\frac{1}{3} \cdot 13\frac{1}{2}$$

$$\frac{32}{1} \cdot \frac{27}{2} = 288$$



$$\begin{array}{r} 32 \\ \times 9 \\ \hline 288 \end{array}$$

The area of the court is  $288\text{m}^2$ .