

Lesson 4: Interpreting and Computing Division of a Fraction by a Fraction—More Models

Classwork

Opening Exercise

Write at least three equivalent fractions for each fraction below.

* a. $\frac{2}{3}$ $\frac{4}{6}$ $\frac{6}{9}$ $\frac{8}{12}$ $\frac{10}{15}$ $\frac{12}{18}$

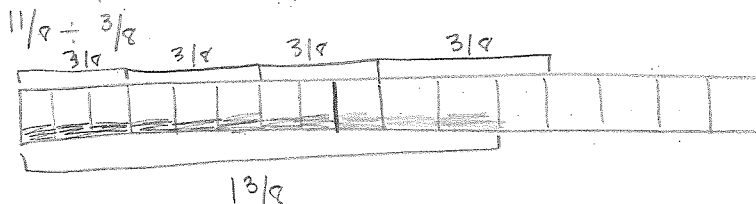
* b. $\frac{10}{12}$ $\frac{5}{6}$ $\frac{15}{18}$ $\frac{20}{24}$ $\frac{25}{30}$ $\frac{30}{36}$

Example 1

* Molly has $1\frac{3}{8}$ cups of strawberries. She needs $\frac{3}{8}$ cup of strawberries to make one batch of muffins. How many batches can Molly make?

Use a model to support your answer. $1\frac{3}{8} \div \frac{3}{8} = 1\frac{11}{8}$

How many $\frac{3}{8}$ are in $1\frac{3}{8}$



$$\frac{11}{8} \cdot \frac{8}{3} = \frac{88}{24} = 3\frac{2}{3}$$

Molly can make $3\frac{2}{3}$ batches of muffins.

Adv.
*

Example 2

Molly's friend, Xavier, also has $\frac{11}{8}$ cups of strawberries. He needs $\frac{3}{4}$ cup of strawberries to make a batch of tarts. How many batches can he make? Draw a model to support your solution.

$\frac{11}{8} = 1\frac{5}{8}$ batches of strawberries.

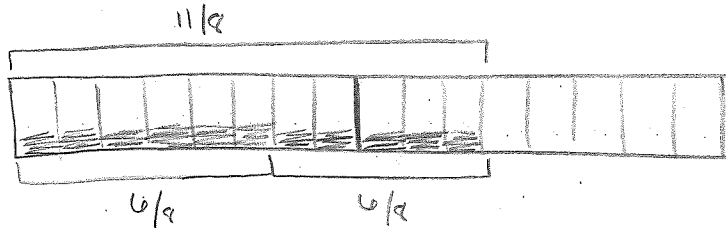
Change $\frac{3}{4}$ to $\frac{6}{8}$ to make equivalent

$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8}$

This is so my denominators are the same.

$\frac{11}{8} \div \frac{6}{8} = \frac{11}{8} \cdot \frac{8}{6} = \frac{88}{48} = 1\frac{40}{48} \div 8 = 1\frac{5}{6}$

$1\frac{5}{8} \div \frac{6}{8}$



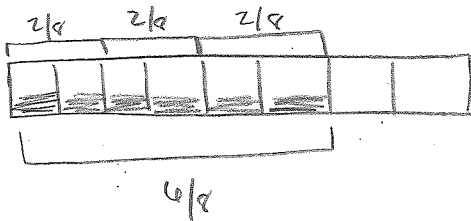
$\frac{11}{8} \div \frac{6}{8} = \frac{11}{6} = 1\frac{5}{6}$

Xavier has enough to make $1\frac{5}{6}$ batches.

Example 3

* Find the quotient: $\frac{6}{8} \div \frac{2}{8}$. Use a model to show your answer.

$\frac{6}{8} \div \frac{2}{8} = \frac{6}{8} \cdot \frac{8}{2} = \frac{48}{16} \div 8 = \frac{6}{2} \div 2 = 3$



OR,

$\frac{6}{8} \div \frac{2}{8} = 3$ The units, eighths, cancel out.



2 units = 6 eighths

1 unit of eighths = 2 = 3 eighths

8 units = 8 x 3 = 24 eighths = 3

S.20

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Example 4

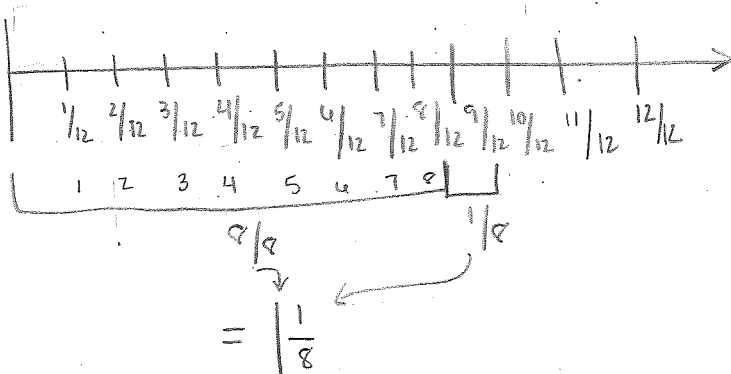
Find the quotient: $\frac{3}{4} \div \frac{2}{3}$. Use a model to show your answer.

$$\frac{3}{4} \div \frac{2}{3} = \frac{3}{4} \cdot \frac{3}{2} = \frac{9}{8} = 1\frac{1}{8}$$

Create equiv. fractions

$$\frac{3}{4} \times 3 = \frac{9}{12} \quad \frac{2}{3} \times 4 = \frac{8}{12}$$

$$\frac{9}{12} \div \frac{8}{12}$$



Exercises 1–5

Find each quotient.

1. $\frac{6}{2} \div \frac{3}{4}$

$$\frac{6}{2} \div \frac{3}{4} = \frac{6}{2} \cdot \frac{4}{3} = \frac{24}{6} = 4$$

OR

Make Equivalent

$$\frac{6}{2} \times 2 = \frac{12}{4} \quad \frac{12}{4} \div \frac{3}{3} = \frac{36}{12} \div 12 = 4$$

OR,

$$\frac{12}{4} \div \frac{3}{4} \quad 12 \div 3 = 4$$

2. $\frac{2}{3} \div \frac{2}{5}$

$$\frac{2}{3} \cdot \frac{5}{2} = \frac{10}{6} = \left| \frac{4}{6} \div 2 = \right| \frac{2}{3}$$

make equiv.

$$\frac{2}{3} \times 5 = \frac{10}{15}$$

$$\frac{2}{5} \times 3 = \frac{6}{15}$$

$$\frac{10}{15} \div \frac{6}{15}$$

$$\frac{10}{6} = \left| \frac{4}{6} \div 2 = \right| \frac{2}{3}$$

3. $\frac{7}{8} \div \frac{1}{2}$

$$\frac{7}{8} \cdot \frac{2}{1} = \frac{14}{8} = \left| \frac{6}{8} \div 2 = \right| \frac{3}{4}$$

make equiv.

$$\frac{7}{8} = \frac{7}{8} \text{ (leave alone)} \quad \frac{1}{2} \cdot 4 = \frac{4}{2}$$

$$\frac{7}{8} \div \frac{4}{8} = \frac{7}{4} = \frac{3}{4}$$

4. $\frac{3}{5} \div \frac{1}{4}$

$$\frac{3}{5} \cdot \frac{4}{1} = \frac{12}{5} = 2 \frac{2}{5}$$

OR.

$$\frac{3}{5} \cdot 4 = \frac{12}{5}$$

$$\frac{1}{4} \cdot 5 = \frac{5}{20}$$

$$\frac{12}{20} \div \frac{5}{20}$$

$$\frac{12}{5} = 2 \frac{2}{5}$$

$$5. \quad \frac{5}{4} \div \frac{1}{3} \qquad \frac{5}{4} \cdot \frac{3}{1} = \frac{15}{4} = 3\frac{3}{4}$$

OR

$$\frac{5}{4} \cdot 3 = \frac{15}{4}$$

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

$$\frac{15}{4} \div \frac{4}{12}$$

$$\frac{15}{4} = 3\frac{3}{4}$$