DIVIDE A FRACTION BY AN INTEGER

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Share $\frac{4}{5}$ equally into 2 groups.

Each group gets 2 of the fifths.

$\frac{4}{5} \div 2 = \frac{2}{5}$



1 Share the shaded parts equally into groups.

a) 

$\frac{6}{7} \div 3 = \frac{\square}{\square}$

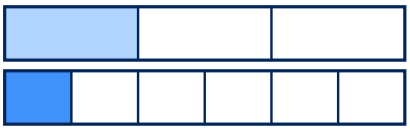
b) 

$\frac{8}{9} \div 4 = \frac{\square}{\square}$

2 Each part in the bottom bar is half of a part in the top bar.

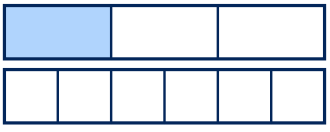
a) 

Half of $\frac{1}{2} = \frac{\square}{\square}$

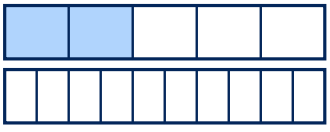
b) 

Half of $\frac{1}{3} = \frac{\square}{\square}$

3 Shade the bottom bar to match the top bar. Find the missing numerator.

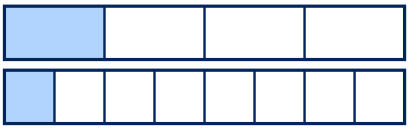
a) 

$\frac{1}{3} = \frac{\square}{6}$

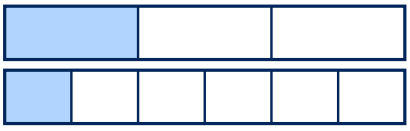
b) 

$\frac{2}{5} = \frac{\square}{10}$

4 Circle the bigger fraction in each pair.

a) 

$\frac{1}{4}$ $\frac{1}{8}$

b) 

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

When you divide a fraction by 2, the answer is SMALLER BIGGER

DIVIDE A FRACTION BY AN INTEGER

SUPPORT

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KEY IDEA

If the numerator divides exactly, divide the numerator. $\frac{6}{7} \div 2 = \frac{3}{7}$

If it does not, use an equivalent fraction or multiply by the reciprocal.

$\frac{3}{5} \div 2 = \frac{6}{10} \div 2 = \frac{3}{10}$ or $\frac{3}{5} \div 2 = \frac{3}{5} \times \frac{1}{2} = \frac{3}{10}$

1 Work out. Divide the numerator.

a) $\frac{8}{11} \div 4 = \frac{\square}{\square}$

b) $\frac{9}{10} \div 3 = \frac{\square}{\square}$

c) $\frac{10}{13} \div 5 = \frac{\square}{\square}$

d) $\frac{12}{17} \div 6 = \frac{\square}{\square}$

2 Each bar is one whole, split into thirds or fifths, then split again. Work out the divisions.

a)



$\frac{1}{3} \div 2 = \frac{\square}{\square}$

b)



$\frac{2}{5} \div 3 = \frac{\square}{\square}$

3 Multiply by the reciprocal of the integer.

a) $\frac{3}{8} \div 2 = \frac{3}{8} \times \frac{1}{2} = \frac{\square}{\square}$

b) $\frac{5}{6} \div 4 = \frac{5}{6} \times \frac{1}{\square} = \frac{\square}{\square}$

c) $\frac{2}{7} \div 5 = \frac{2}{7} \times \frac{\square}{\square} = \frac{\square}{\square}$

4 Ali divided the numerator and the denominator by 2.

Ali writes: $\frac{6}{8} \div 2 = \frac{3}{4}$

a) Why is Ali wrong?

b) Work out the correct answer. $\frac{6}{8} \div 2 = \frac{\square}{\square}$

DIVIDE A FRACTION BY AN INTEGER

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Dividing by an integer n is the same as multiplying by its reciprocal, one over n. Simplify your answer.

$\frac{4}{9} \div 6 = \frac{4}{9} \times \frac{1}{6} = \frac{4}{54} = \frac{2}{27}$

FLUENCY

1 Work out. Give each answer in its simplest form.

a) $\frac{4}{7} \div 2 = \frac{\square}{\square}$

b) $\frac{5}{9} \div 3 = \frac{\square}{\square}$

c) $\frac{7}{10} \div 7 = \frac{\square}{\square}$

d) $\frac{9}{11} \div 6 = \frac{\square}{\square}$

e) $\frac{8}{15} \div 12 = \frac{\square}{\square}$

f) $\frac{11}{12} \div 4 = \frac{\square}{\square}$

2 Find the missing numbers.

a) $\frac{6}{7} \div \square = \frac{2}{7}$

b) $\frac{\square}{9} \div 4 = \frac{1}{18}$

c) $\frac{3}{5} \div \square = \frac{1}{10}$

d) $\frac{10}{11} \div 5 = \frac{\square}{11}$

REASONING

3 Show that this calculation is correct in two different ways.

$\frac{3}{8} \div 6 = \frac{1}{16}$

Method 1: .....

Method 2: .....

4 Is dividing one-half by 4 the same as finding one-quarter of one-half? Explain your answer.

.....

.....

DIVIDE A FRACTION BY AN INTEGER

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) Dividing a positive fraction by 2 makes it smaller. ALWAYS SOMETIMES NEVER

b) $\frac{a}{b} \div a = \frac{1}{b}$ (a is not 0) ALWAYS SOMETIMES NEVER

c) To divide by n, divide the top and bottom by n. ALWAYS SOMETIMES NEVER

d) $\frac{2}{3} \div n$ is a unit fraction (n is a positive integer) ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 Sharing problems.

a) Three-quarters of a tray of brownies is shared equally between 6 friends. What fraction of the tray does each get?

b) Five-sixths of a litre of juice is poured equally into 4 glasses. How much juice is in each glass?

$\frac{\square}{\square}$ litre

3 Laura has four-fifths of a kilogram of clay. She uses half of it, then cuts the rest into 8 equal pieces.

a) What fraction of a kilogram is each piece? $\frac{\square}{\square}$

b) How many grams is each piece? $\square$ g

★ CHALLENGE FOR ALL

4 Solve each equation. Give x as a fraction in its simplest form.

a) $3x = \frac{6}{7}$

$x = \frac{\square}{\square}$

b) $4x = \frac{3}{5}$

$x = \frac{\square}{\square}$

c) $\frac{2}{3} \div x = \frac{1}{12}$

$x = \frac{\square}{\square}$

STEP 5 ANSWERS

ANSWERS

Divide a fraction by an integer

BUILDING BLOCKS

1a) $\frac{2}{7}$ b) $\frac{2}{9}$

2a) $\frac{1}{4}$ b) $\frac{1}{6}$

3a) $\frac{2}{6}$ b) $\frac{4}{10}$

4a) $\frac{1}{4}$ b) $\frac{1}{3}$ smaller

SUPPORT

1a) $\frac{2}{11}$ b) $\frac{3}{10}$ c) $\frac{2}{13}$ d) $\frac{2}{17}$

2a) $\frac{1}{6}$ b) $\frac{2}{15}$

3a) $\frac{3}{16}$ b) $\frac{1}{4}$, $\frac{5}{24}$ c) $\frac{1}{5}$, $\frac{2}{35}$

4a) Dividing top and bottom by 2 gives an equivalent fraction (the same size) b) $\frac{6}{16} = \frac{3}{8}$

CORE

1a) $\frac{2}{7}$ b) $\frac{5}{27}$ c) $\frac{1}{10}$ d) $\frac{3}{22}$ e) $\frac{2}{45}$ f) $\frac{11}{48}$

2a) 3 b) 2 c) 6 d) 2

3) $\frac{3}{48} = \frac{1}{16}$ using $\frac{3}{8} \times \frac{1}{6}$; or $\frac{3}{8} = \frac{6}{16}$, then $\frac{6}{16} \div 6 = \frac{1}{16}$

4) Yes: $\frac{1}{2} \div 4 = \frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$, and $\frac{1}{4}$ of $\frac{1}{2} = \frac{1}{8}$

GREATER DEPTH

1a) Always b) Always c) Sometimes (only when n = 1)

d) Sometimes ($\frac{2}{3} \div 2 = \frac{1}{3}$; $\frac{2}{3} \div 3 = \frac{2}{9}$)

2a) $\frac{1}{8}$ b) $\frac{5}{24}$ litre

3a) $\frac{1}{20}$ kg b) 50 g

4a) $x = \frac{2}{7}$ b) $x = \frac{3}{20}$ c) $x = 8$