MULTIPLY FRACTIONS

BUILDING BLOCKS

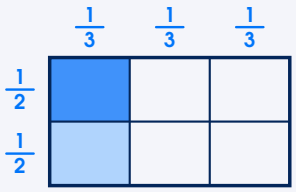
NAME _____ CLASS _____ DATE _____

KEY IDEA

"of" means multiply.

$\frac{1}{2}$ **of** $\frac{1}{3}$ **is the same as** $\frac{1}{2} \times \frac{1}{3}$

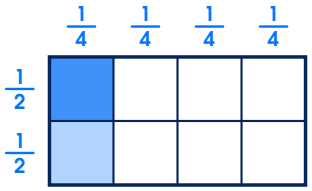
Split one third into 2 equal parts.
Each part is one sixth of the whole.



$= \frac{1}{6}$

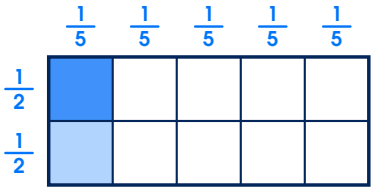
1 What fraction of the whole rectangle is dark blue?

a)



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

b)

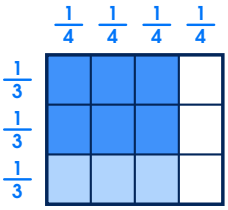


$= \frac{\square}{\square}$

2 What fraction of each grid is dark blue?

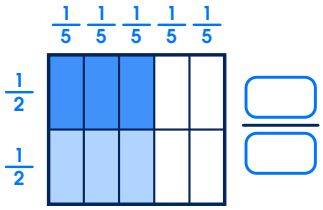
Count the dark parts and count all the parts.

a)



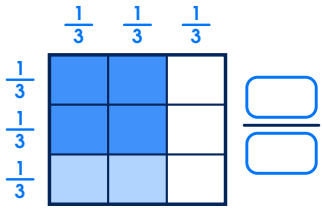
$\frac{\square}{\square}$

b)



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

c)



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

3 Multiply the numerators. Multiply the denominators.

a) $\frac{1}{2} \times \frac{1}{5} = \frac{1 \times 1}{2 \times 5} = \frac{\square}{\square}$

b) $\frac{1}{3} \times \frac{2}{5} = \frac{1 \times 2}{3 \times 5} = \frac{\square}{\square}$

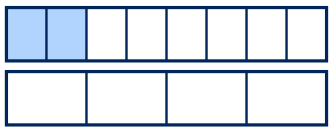
c) $\frac{3}{4} \times \frac{1}{2} = \frac{\square}{\square}$

d) $\frac{2}{3} \times \frac{2}{5} = \frac{\square}{\square}$

4 Find the missing numerators.

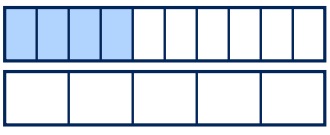
Shade the bottom bar to match the top bar.

a)



$\frac{2}{8} = \frac{\square}{4}$

b)



$\frac{4}{10} = \frac{\square}{5}$

MULTIPLY FRACTIONS

SUPPORT

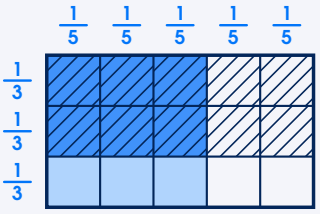
NAME _____ CLASS _____ DATE _____

KEY IDEA

$\frac{2}{3} \times \frac{3}{5}$ means $\frac{2}{3}$ of $\frac{3}{5}$

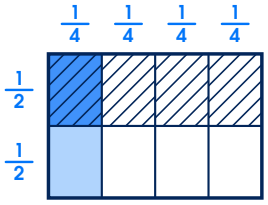
Multiply the numerators. Multiply the denominators.

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



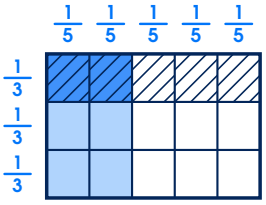
1 Use each diagram to complete the multiplication.

a)



$\frac{1}{2} \times \frac{1}{4} = \frac{\square}{\square}$

b)



$\frac{1}{3} \times \frac{2}{5} = \frac{\square}{\square}$

2 Work out.

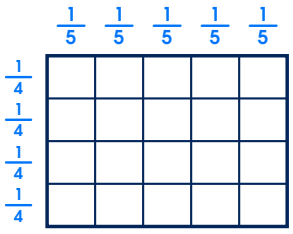
a) $\frac{1}{3} \times \frac{1}{4} = \frac{\square}{\square}$

b) $\frac{1}{5} \times \frac{1}{2} = \frac{\square}{\square}$

c) $\frac{2}{3} \times \frac{1}{5} = \frac{\square}{\square}$

d) $\frac{3}{4} \times \frac{3}{5} = \frac{\square}{\square}$

3 Shade the grid to show three-quarters of two-fifths.



Step 1: shade $\frac{2}{5}$ of the columns.

Step 2: hatch $\frac{3}{4}$ of the rows.

$\frac{3}{4} \times \frac{2}{5} = \frac{\square}{\square}$

4 Leah has made a mistake.

Leah writes: $\frac{2}{5} \times \frac{1}{3} = \frac{3}{8}$

a) What has Leah done wrong?

b) Work out the correct answer. $\frac{2}{5} \times \frac{1}{3} = \frac{\square}{\square}$

MULTIPLY FRACTIONS

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Multiply the numerators and multiply the denominators, then simplify. Cancelling common factors first keeps the numbers small: 4 and 8 share 4, and 3 and 9 share 3.

$$\frac{4}{9} \times \frac{3}{8} = \frac{1}{3} \times \frac{1}{2} = \frac{1}{6}$$

FLUENCY

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

a) $\frac{3}{5} \times \frac{2}{7} = \frac{\square}{\square}$

b) $\frac{5}{6} \times \frac{3}{4} = \frac{\square}{\square}$

c) $\frac{4}{9} \times \frac{3}{10} = \frac{\square}{\square}$

d) $\frac{7}{12} \times \frac{8}{21} = \frac{\square}{\square}$

e) $\frac{5}{8} \times \frac{4}{15} = \frac{\square}{\square}$

f) $\frac{9}{14} \times \frac{7}{12} = \frac{\square}{\square}$

2 Find the missing numbers.

a) $\frac{2}{3} \times \frac{\square}{7} = \frac{8}{21}$

b) $\frac{\square}{5} \times \frac{3}{4} = \frac{9}{20}$

c) $\frac{3}{\square} \times \frac{5}{8} = \frac{15}{56}$

d) $\frac{4}{5} \times \frac{5}{\square} = \frac{1}{3}$

REASONING

3 Without working them out, is each answer greater or less than three-quarters?

a) $\frac{3}{4} \times \frac{5}{6}$ GREATER LESS

b) $\frac{3}{4} \times \frac{9}{8}$ GREATER LESS

c) Explain how you decided.

.....

.....

4 Does the product of two unit fractions always have a numerator of 1? Explain how you know.

.....

.....

MULTIPLY FRACTIONS

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) Two proper fractions multiply to less than both. ALWAYS SOMETIMES NEVER

b) To multiply fractions you need a common denominator. ALWAYS SOMETIMES NEVER

c) $\frac{a}{b} \times \frac{b}{a} = 1$ (a and b are not 0) ALWAYS SOMETIMES NEVER

d) $\frac{a}{b} \times \frac{c}{d}$ has a denominator bigger than b and d ALWAYS SOMETIMES NEVER

PROBLEM SOLVING

2 A rectangular field is five-sixths of a km long and three-fifths of a km wide.

a) Work out the area of the field. ☐

b) Two-thirds of the field is planted with wheat. What area is wheat? ☐

3 Three-quarters of Year 8 have a pet. Two-fifths of these have a dog.

a) What fraction of the pupils in Year 8 have a dog? $\frac{\square}{\square}$

b) There are 240 pupils in Year 8. How many have a dog? ☐

★ CHALLENGE FOR ALL

4 Here is the start of a product that follows a pattern.

$\frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \frac{5}{6} \times \ldots$

a) Work out the first three. $\frac{\square}{\square}$

b) Work out $\frac{2}{3} \times \frac{3}{4} \times \frac{4}{5} \times \ldots \times \frac{19}{20}$. $\frac{\square}{\square}$

c) The product continues. Which fraction makes it first less than $\frac{1}{50}$? $\frac{\square}{\square}$

STEP 2 ANSWERS

ANSWERS

Multiply fractions

BUILDING BLOCKS

1a) $\frac{1}{8}$ b) $\frac{1}{10}$

2a) $\frac{6}{12} = \frac{1}{2}$ b) $\frac{3}{10}$ c) $\frac{4}{9}$

3a) $\frac{1}{10}$ b) $\frac{2}{15}$ c) $\frac{3}{8}$ d) $\frac{4}{15}$

4a) 1 b) 2

SUPPORT

1a) $\frac{1}{8}$ b) $\frac{2}{15}$

2a) $\frac{1}{12}$ b) $\frac{1}{10}$ c) $\frac{2}{15}$ d) $\frac{9}{20}$

3) 6 of the 20 parts: $\frac{6}{20} = \frac{3}{10}$

4a) She added the numerators and added the denominators b) $\frac{2}{15}$

CORE

1a) $\frac{6}{35}$ b) $\frac{5}{8}$ c) $\frac{2}{15}$ d) $\frac{2}{9}$ e) $\frac{1}{6}$ f) $\frac{3}{8}$

2a) 4 b) 3 c) 7 d) 12

3a) Less b) Greater c) $\frac{5}{6} < 1$ makes it smaller; $\frac{9}{8} > 1$ makes it bigger

4) Yes: $\frac{1}{a} \times \frac{1}{b} = \frac{1}{ab}$, and $1 \times 1 = 1$

GREATER DEPTH

1a) Always b) Never c) Always d) Sometimes ($\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$ yes; $\frac{2}{3} \times \frac{3}{4} = \frac{1}{2}$ no)

2a) $\frac{1}{2}$ km² b) $\frac{1}{3}$ km²

3a) $\frac{3}{10}$ b) 72

4a) $\frac{2}{5}$ b) $\frac{1}{10}$ c) $\frac{100}{101}$ (the product is then $\frac{2}{101}$)