MULTIPLY A FRACTION BY AN INTEGER

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Adding the same fraction again and again: add the numerators (tops).

The denominator (bottom) stays the same.



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

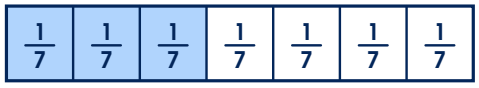
1 What fraction of each bar is shaded?

a)  $\frac{\square}{\square}$

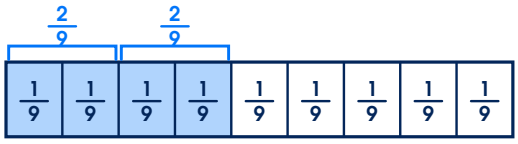
b)  $\frac{\square}{\square}$

c)  $\frac{\square}{\square}$

2 Add the fractions. Use the bars to help you.

a) 

$$\frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{\square}{\square}$$

b) 

$$\frac{2}{9} + \frac{2}{9} = \frac{\square}{\square}$$

3 Count the jumps on each number line. Where do you land?

a) 

4 jumps of $\frac{1}{6} = \frac{\square}{\square}$

b) 

5 jumps of $\frac{1}{8} = \frac{\square}{\square}$

4 Write each fraction as a mixed number. Use the bars to help you.

Count the whole bars first, then the parts left over.

a) 

$\frac{7}{4} = \square\ \frac{\square}{\square}$

wholes

b) 

$\frac{8}{3} = \square\ \frac{\square}{\square}$

wholes

MULTIPLY A FRACTION BY AN INTEGER

SUPPORT

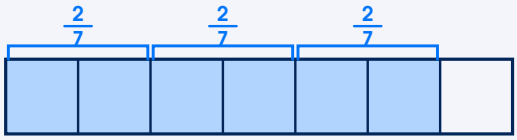
NAME _____ CLASS _____ DATE _____

KEY IDEA

Multiplying is the same as repeated adding.

$3 \times \frac{2}{7} = \frac{2}{7} + \frac{2}{7} + \frac{2}{7} = \frac{6}{7}$

Multiply the numerator. The denominator stays the same.



1 Write each addition as a multiplication. Then work it out.

a) $\frac{1}{9} + \frac{1}{9} + \frac{1}{9} + \frac{1}{9} = \square \times \frac{1}{9} = \frac{\square}{\square}$

b) $\frac{2}{11} + \frac{2}{11} + \frac{2}{11} = \square \times \frac{2}{11} = \frac{\square}{\square}$

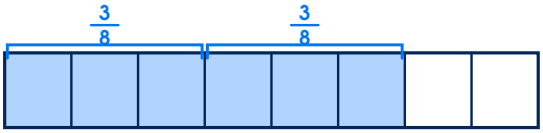
2 Use the bar models to work out the multiplications.

a)



$4 \times \frac{1}{5} = \frac{\square}{\square}$

b)



$2 \times \frac{3}{8} = \frac{\square}{\square}$

3 Work out.

a) $7 \times \frac{1}{9} = \frac{\square}{\square}$

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

c) $3 \times \frac{2}{9} = \frac{\square}{\square}$

d) $\frac{3}{10} \times 3 = \frac{\square}{\square}$

4 Amir has made a mistake.

Amir writes: $2 \times \frac{3}{7} = \frac{6}{14}$

a) What mistake has Amir made?

b) Work out the correct answer. $2 \times \frac{3}{7} = \frac{\square}{\square}$

MULTIPLY A FRACTION BY AN INTEGER

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Multiply the numerator by the integer; the denominator stays the same. Then simplify, and write an improper fraction as a mixed number.

$4 \times \frac{5}{6} = \frac{20}{6} = \frac{10}{3} = 3\frac{1}{3}$ $3 \times 1\frac{1}{4} = 3 \times \frac{5}{4} = \frac{15}{4} = 3\frac{3}{4}$

FLUENCY

1 Work out. Give each answer in its simplest form, as a mixed number where needed.

a) $6 \times \frac{2}{9} =$ ☐

b) $\frac{3}{4} \times 10 =$ ☐

c) $8 \times \frac{5}{12} =$ ☐

d) $\frac{7}{10} \times 15 =$ ☐

e) $3 \times 1\frac{2}{5} =$ ☐

f) $12 \times \frac{3}{8} =$ ☐

2 Find the missing numbers.

a) $\square \times \frac{2}{7} = \frac{10}{7}$

b) $4 \times \frac{\square}{9} = \frac{28}{9}$

c) $6 \times \frac{3}{\square} = \frac{18}{11}$

d) $\frac{5}{\square} \times 3 = \frac{15}{4}$

REASONING

3 Look at these two calculations.

a) Show that $4 \times \frac{3}{7}$ and $3 \times \frac{4}{7}$ give the same answer.

b) Will swapping the integer and the numerator always work? Explain.

4 Jo says, "Multiplying by a fraction always gives an answer less than 1." Is Jo correct? Use an example to explain.

MULTIPLY 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) A positive integer × a proper fraction is less than the integer. ALWAYS SOMETIMES NEVER

b) An integer × a proper fraction is less than 1 ALWAYS SOMETIMES NEVER

c) $n \times \frac{1}{n} = 1$ (n is a positive integer) ALWAYS SOMETIMES NEVER

d) An even number × $\frac{1}{4}$ is a whole number. ALWAYS SOMETIMES NEVER

.....

PROBLEM SOLVING

2 Ella uses three-quarters of a cup of oats in each batch of flapjack.

a) She makes 7 batches. How many cups of oats does she use? ☐

b) Oats are sold in bags of 2 cups. How many bags must she buy? ☐

3 n is a whole number.

$n \times \frac{3}{8}$ is greater than 2 but less than 4

Find all the possible values of n. ☐

★ CHALLENGE FOR ALL

4 Use the digits 2, 3, 4 and 5, one in each box. One digit is not used each time.

☐ × $\frac{☐}{☐}$

a) Make the greatest possible answer. .....

b) Make the smallest possible answer. .....

c) Make an answer between 3 and 4. .....

STEP 1 ANSWERS

ANSWERS

Multiply a fraction by an integer

BUILDING BLOCKS

1a) $\frac{2}{5}$ b) $\frac{3}{8}$ c) $\frac{5}{6}$

2a) $\frac{3}{7}$ b) $\frac{4}{9}$

3a) $\frac{4}{6} = \frac{2}{3}$ b) $\frac{5}{8}$

4a) $1\frac{3}{4}$ b) $2\frac{2}{3}$

SUPPORT

1a) $4 \times \frac{1}{9} = \frac{4}{9}$ b) $3 \times \frac{2}{11} = \frac{6}{11}$

2a) $\frac{4}{5}$ b) $\frac{6}{8} = \frac{3}{4}$

3a) $\frac{7}{9}$ b) $\frac{5}{6}$ c) $\frac{6}{9} = \frac{2}{3}$ d) $\frac{9}{10}$

4a) He multiplied the denominator by 2 as well b) $\frac{6}{7}$

CORE

1a) $\frac{4}{3} = 1\frac{1}{3}$ b) $\frac{15}{2} = 7\frac{1}{2}$ c) $\frac{10}{3} = 3\frac{1}{3}$ d) $\frac{21}{2} = 10\frac{1}{2}$ e) $\frac{21}{5} = 4\frac{1}{5}$

f) $\frac{9}{2} = 4\frac{1}{2}$

2a) 5 b) 7 c) 11 d) 4

3a) both = $\frac{12}{7} = 1\frac{5}{7}$ b) Yes: both give (integer × numerator) ÷ denominator

4) No, e.g. $5 \times \frac{2}{3} = 3\frac{1}{3} > 1$

GREATER DEPTH

1a) Always b) Sometimes ($2 \times \frac{1}{3}$ yes, $2 \times \frac{2}{3}$ no) c) Always

d) Sometimes (8 yes, 6 no)

2a) $\frac{21}{4} = 5\frac{1}{4}$ cups b) 3 bags

3) n = 6, 7, 8, 9, 10

4a) 10 ($5 \times \frac{4}{2}$ or $4 \times \frac{5}{2}$) b) $2 \times \frac{3}{5} = 1\frac{1}{5}$ c) e.g. $3 \times \frac{5}{4} = 3\frac{3}{4}$, $2 \times \frac{5}{3} = 3\frac{1}{3}$