# DIVIDE AN INTEGER BY A FRACTION

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

**KEY IDEA**

**Dividing asks: how many groups fit?**

**$3 \div \frac{1}{2}$ means how many halves fit into 3?**

Count the halves: 6 so $3 \div \frac{1}{2} = 6$



**1** Circle equal groups to answer each question.

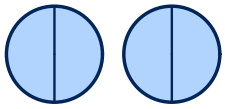
a) ●●●●●●●●●●●●

How many 3s in 12? $12 \div 3 =$ ☐

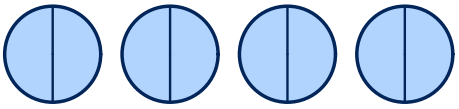
b) ●●●●●●●●●●

How many 5s in 10? $10 \div 5 =$ ☐

**2** How many halves are there? Count the halves.

a) 

$2 \div \frac{1}{2} =$ ☐

b) 

$4 \div \frac{1}{2} =$ ☐

**3** How many quarters are there? Count the quarters.

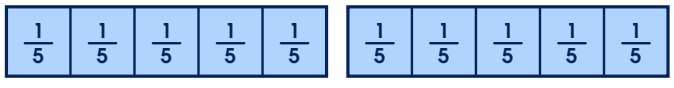
a) 


$1 \div \frac{1}{4} =$ ☐

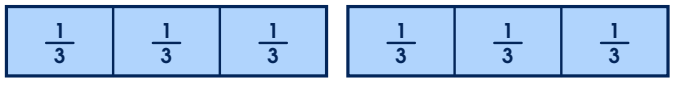
b) 


$3 \div \frac{1}{4} =$ ☐

**4** How many fifths are in 2? How many thirds are in 2?

a) 


$2 \div \frac{1}{5} =$ ☐

b) 


$2 \div \frac{1}{3} =$ ☐

# DIVIDE AN INTEGER BY A FRACTION

SUPPORT

NAME _____ CLASS _____ DATE _____

**KEY IDEA**

**$3 \div \frac{1}{4}$ means how many quarters are in 3?**

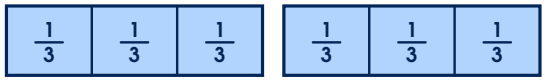
Each whole has 4 quarters, so 3 wholes have 3 × 4 quarters.

$3 \div \frac{1}{4} = 3 \times 4 = 12$



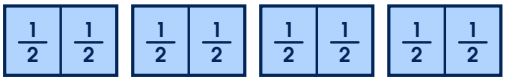
**1** Use the bar models to complete the divisions.

a)




$2 \div \frac{1}{3} =$ ☐

b)




$4 \div \frac{1}{2} =$ ☐

**2** Work out.

a) $5 \div \frac{1}{2} =$ ☐

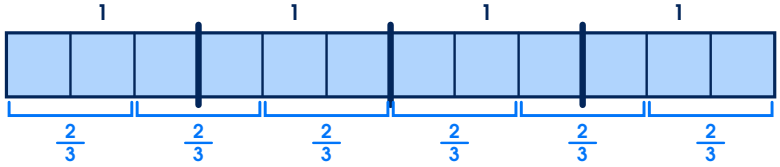
b) $3 \div \frac{1}{6} =$ ☐

c) $7 \div \frac{1}{4} =$ ☐

d) $10 \div \frac{1}{3} =$ ☐

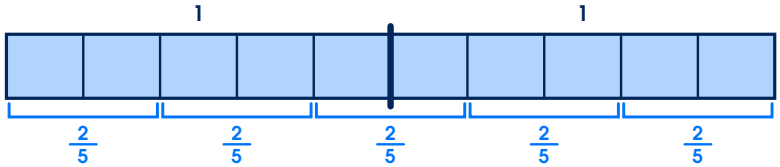
**3** How many groups of the fraction fit? Count the brackets.

a)




$4 \div \frac{2}{3} =$ ☐

b)




$2 \div \frac{2}{5} =$ ☐

**4** Tia has made a mistake.

**Tia writes:** $6 \div \frac{1}{2} = 3$

a) What mistake has Tia made?

b) Work out the correct answer. $6 \div \frac{1}{2} =$ ☐

# DIVIDE AN INTEGER BY A FRACTION

CORE

NAME _____ CLASS _____ DATE _____

**KEY IDEA**

Dividing by a fraction is the same as multiplying by its reciprocal. 6 ÷ three-quarters asks "how many three-quarters fit into 6?"

$$6 \div \frac{3}{4} = 6 \times \frac{4}{3} = \frac{24}{3} = 8$$

## FLUENCY

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

a) $9 \div \frac{1}{5} =$ ☐

b) $8 \div \frac{4}{7} =$ ☐

c) $5 \div \frac{2}{3} =$ ☐

d) $12 \div \frac{9}{10} =$ ☐

e) $3 \div \frac{5}{8} =$ ☐

f) $20 \div \frac{5}{6} =$ ☐

## REASONING

**2** A ribbon 5 m long is cut into pieces that are each two-thirds of a metre long.

a) How many whole pieces can be cut? ☐

b) How much ribbon is left over? ☐

**3** Find the missing fractions.

a) $6 \div \frac{\square}{\square} = 9$ Find two different answers.

b) $12 \div \frac{\square}{\square} = 16$ Give the answer in its simplest form.

**4** Kai says, "Dividing always makes a number smaller." Use an example to show that Kai is wrong.

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# DIVIDE AN INTEGER BY A FRACTION

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 > the integer — ALWAYS / SOMETIMES / NEVER

**b)** $n \div \frac{1}{n} = n^2$ (n is a positive integer) — ALWAYS / SOMETIMES / NEVER

**c)** An integer ÷ a fraction gives a whole number. — ALWAYS / SOMETIMES / NEVER

**d)** $6 \div \frac{1}{2} = \frac{1}{2} \div 6$ — ALWAYS / SOMETIMES / NEVER

## PROBLEM SOLVING

**2** Find the missing numbers.

**a)** $\square \div \frac{1}{3} = 21$

**b)** $6 \div \frac{\square}{5} = 10$

**c)** $10 \div \frac{2}{\square} = 35$

**d)** $4 \div \frac{\square}{7} = 7$

**3** Without working them out, write these in order of size, smallest first.

| $6 \div \frac{1}{2}$ | $6 \div \frac{1}{3}$ | $6 \div \frac{2}{3}$ | $6 \div 2$ |
|---|---|---|---|
| | < | < | < |

Explain how you decided. _____

## ★ CHALLENGE FOR ALL

**4** Work out each calculation. Work from left to right, but do brackets first.

**a)** $2 \div \frac{1}{4} \div \frac{1}{2} = \square$

**b)** $2 \div \left(\frac{1}{4} \div \frac{1}{2}\right) = \square$

**c)** Explain why the answers are different. _____

# STEP 4 ANSWERS

ANSWERS

## Divide an integer by a fraction

### BUILDING BLOCKS

1a) 4 b) 2

2a) 4 b) 8

3a) 4 b) 12

4a) 10 b) 6

### SUPPORT

1a) 6 b) 8

2a) 10 b) 18 c) 28 d) 30

3a) 6 b) 5

4a) She halved 6 instead of counting how many halves fit into 6 b) 12

### CORE

1a) 45 b) 14 c) $\frac{15}{2} = 7\frac{1}{2}$ d) $\frac{40}{3} = 13\frac{1}{3}$ e) $\frac{24}{5} = 4\frac{4}{5}$ f) 24

2a) 7 pieces b) $\frac{1}{3}$ m

3a) $\frac{2}{3}, \frac{4}{6}, \frac{6}{9}, \ldots$ b) $\frac{3}{4}$

4) e.g. $6 \div \frac{1}{2} = 12$, which is bigger than 6

### GREATER DEPTH

1a) Always b) Always c) Sometimes ($4 \div \frac{2}{3} = 6$; $1 \div \frac{2}{3} = 1\frac{1}{2}$) d) Never

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

3) $6 \div 2\ (3) < 6 \div \frac{2}{3}\ (9) < 6 \div \frac{1}{2}\ (12) < 6 \div \frac{1}{3}\ (18)$

4a) 16 b) 4

c) The brackets change the order, and division done in a different order gives a different answer