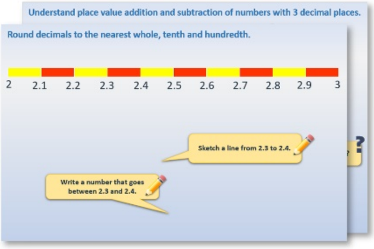
Year 6: Week 2, Day 3
Multiply and divide fractions

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by reading through the **Learning Reminders**. They come from our *PowerPoint* slides.



Understand place value addition and subtraction of numbers with 3 decimal places.

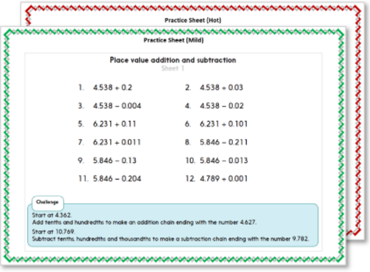
Round decimals to the nearest whole, tenth and hundredth.

Sketch a line from 2.3 to 2.4.

Write a number that goes between 2.3 and 2.4.

---

2. Tackle the questions on the **Practice Sheet**. There might be a choice of either Mild (easier) or Hot (harder)! Check the answers.



Practice Sheet (Hot)

Practice Sheet (Mild)

Place value addition and subtraction

Sheet 1

1. 4.538 + 0.2
2. 4.538 + 0.03
3. 4.538 – 0.004
4. 4.538 – 0.02
5. 6.231 + 0.11
6. 6.231 + 0.101
7. 6.231 + 0.011
8. 5.846 – 0.211
9. 5.846 – 0.13
10. 5.846 – 0.013
11. 5.846 – 0.204
12. 4.789 + 0.001

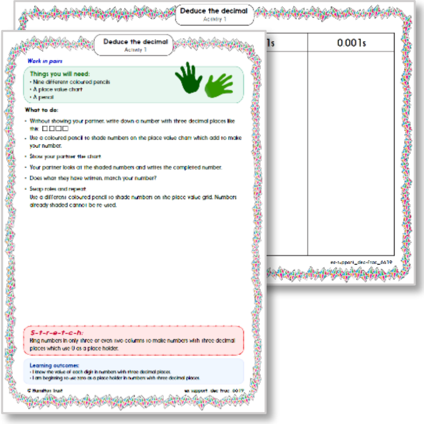
Challenge

Start at 4.362.
Add tenths and hundredths to make an addition chain ending with the number 4.627.

Start at 10.769.
Subtract tenths, hundredths and thousandths to make a subtraction chain ending with the number 9.782.

---

3. Finding it tricky? That's OK… have a go with a grown-up at **A Bit Stuck?**



Deduce the decimal

Activity 1

1s	0.001s

Deduce the decimal

Activity 1

Work in pairs

Things you will need:
- Nine different coloured pencils
- A place value chart
- A pencil

What to do:
- Without showing your partner, write down a number with three decimal places like this: □.□□□
- Use a coloured pencil to shade numbers on the place value chart which add to make your number.
- Show your partner the chart.
- Your partner looks at the shaded numbers and writes the completed number.
- Does what they have written, match your number?
- Swap roles and repeat.
  Use a different coloured pencil to shade numbers on the place value grid. Numbers already shaded cannot be re-used.

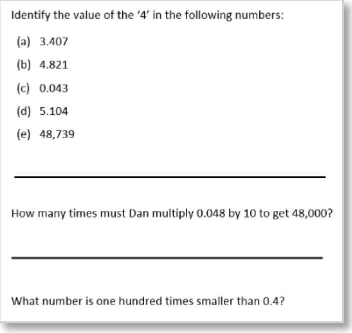
S-t-r-e-t-c-h:
Ring numbers in only three or even two columns to make numbers with three decimal places which use 0 as a place holder.

Learning outcomes:
- I know the value of each digit in numbers with three decimal places.
- I am beginning to use zero as a place holder in numbers with three decimal places.

© Hamilton Trust

---

4. Have I mastered the topic? A few questions to **Check your understanding**. Fold the page to hide the answers!



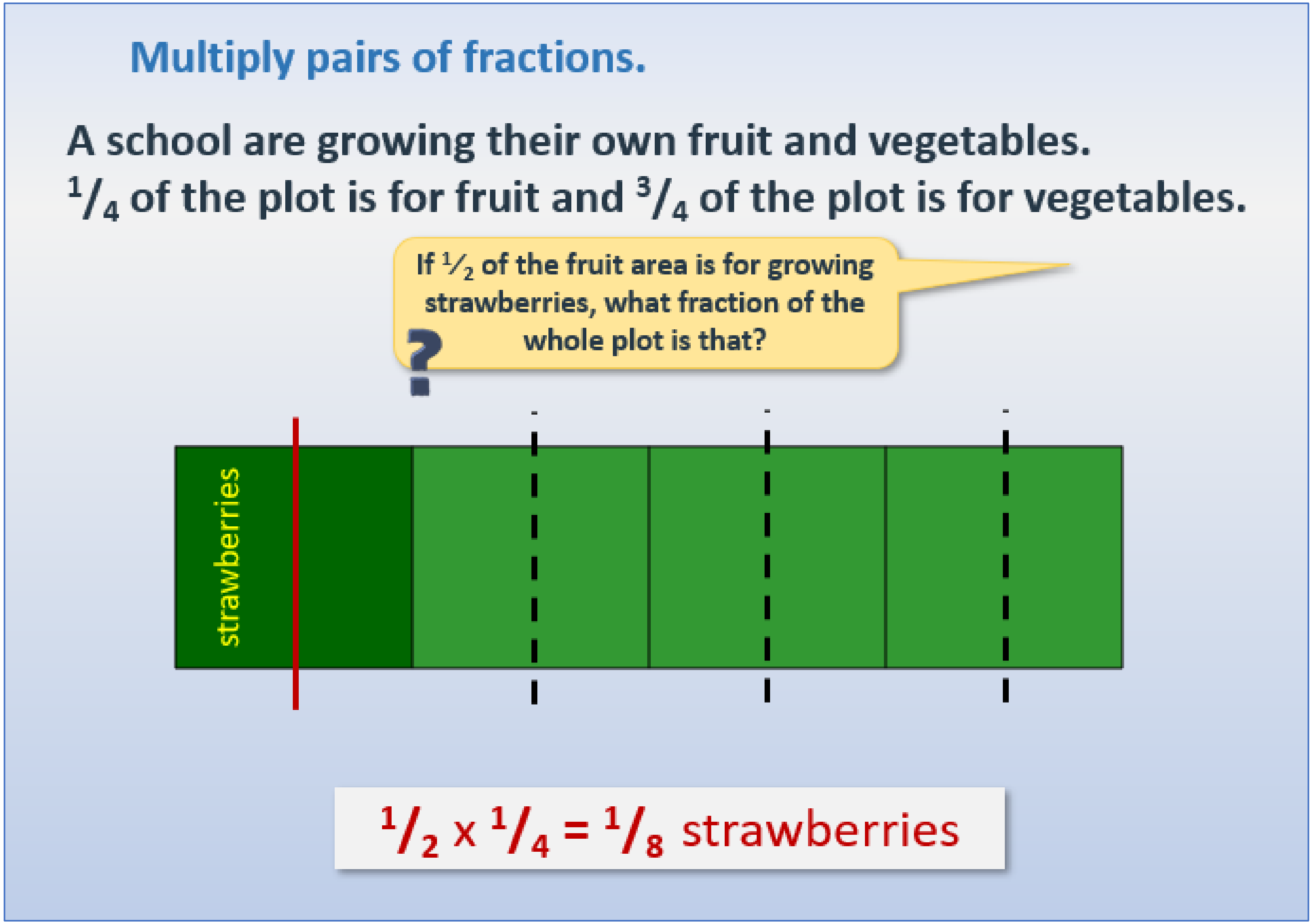
Identify the value of the '4' in the following numbers:

(a) 3.407
(b) 4.821
(c) 0.043
(d) 5.104
(e) 48,739

How many times must Dan multiply 0.048 by 10 to get 48,000?

What number is one hundred times smaller than 0.4?

Learning Reminders



Multiply pairs of fractions.

A school are growing their own fruit and vegetables.
$^{1}/_{4}$ of the plot is for fruit and $^{3}/_{4}$ of the plot is for vegetables.

If $^{1}/_{2}$ of the fruit area is for growing strawberries, what fraction of the whole plot is that?

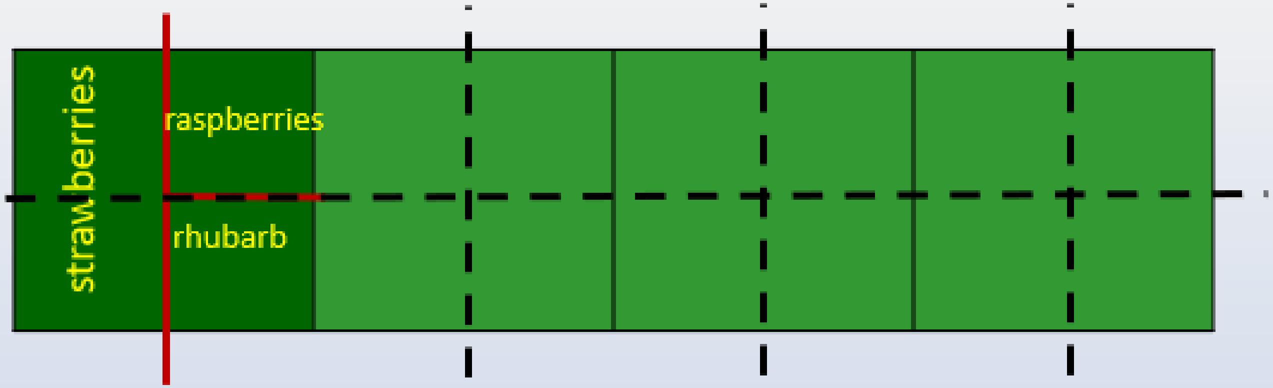
strawberries

$^{1}/_{2} \times {}^{1}/_{4} = {}^{1}/_{8}$ strawberries

Learning Reminders

Multiply pairs of fractions.

A school are growing their own fruit and vegetables.
$^{1}/_{4}$ of the plot is for fruit and $^{3}/_{4}$ of the plot is for vegetables.



?

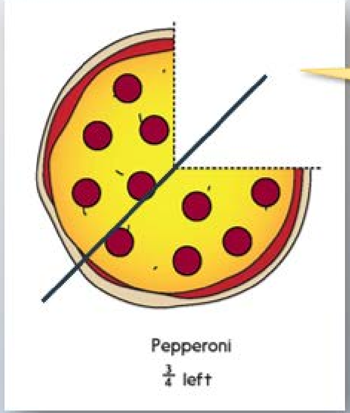
$^{1}/_{4}$ of the fruit area is for raspberries, the other $^{1}/_{4}$ is for rhubarb. What fraction of the whole plot are each of these?

We can calculate a quarter of a quarter by finding

$$^{1}/_{4} \times {}^{1}/_{4} = {}^{1}/_{16}$$

Learning Reminders

Divide fractions by whole numbers.



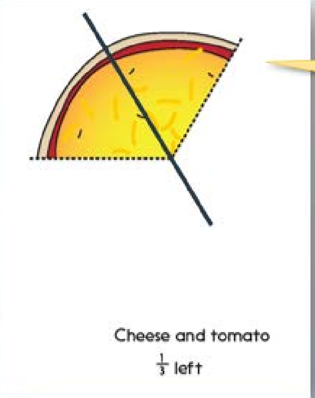
Two children are going to share what's left of the pepperoni pizza.

? They each have half of what's left, but what fraction of the whole pizza do they have each?

Dividing $^{3}/_{4}$ between 2 is the same as finding $^{1}/_{2}$ of $^{3}/_{4}$ ($^{1}/_{2} \times {}^{3}/_{4}$)
so, $^{3}/_{4} \div 2 = {}^{1}/_{2} \times {}^{3}/_{4}$.

$$^{3}/_{4} \div 2 = {}^{3}/_{8}$$

Divide fractions by whole numbers.



Two children are going to share what's left of the cheese and tomato pizza.

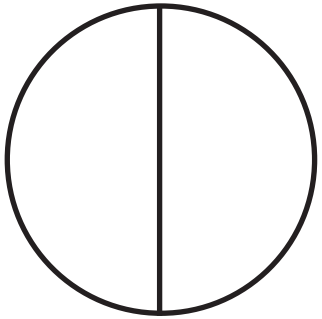
? They each have half of what's left, but what fraction of the whole pizza do they have each?

$$^{2}/_{3} \div 2 = {}^{1}/_{3}$$

Practice Sheet Mild

Find fractions of fractions

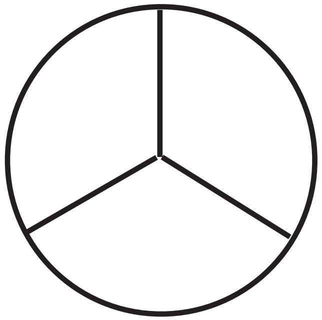
Calculate the fractions of these fractions for each circle. What do you notice about the denominators of your answers?



$\frac{1}{2}$ of $\frac{1}{2}$ is

$\frac{1}{3}$ of $\frac{1}{2}$ is

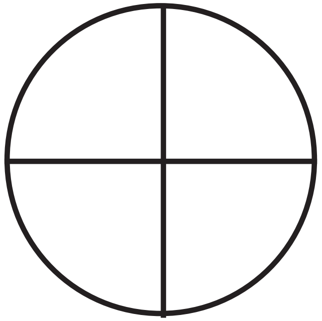
$\frac{1}{4}$ of $\frac{1}{2}$ is



$\frac{1}{2}$ of $\frac{1}{3}$ is

$\frac{1}{3}$ of $\frac{1}{3}$ is

$\frac{1}{4}$ of $\frac{1}{3}$ is



$\frac{1}{2}$ of $\frac{1}{4}$ is

$\frac{1}{3}$ of $\frac{1}{4}$ is

$\frac{1}{4}$ of $\frac{1}{4}$ is

Now try these:

$\frac{1}{2} \times \frac{1}{5}$

$\frac{1}{2} \times \frac{1}{6}$

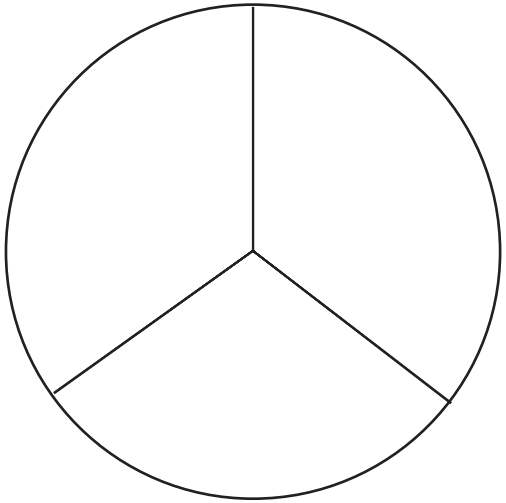
$\frac{1}{2} \times \frac{1}{10}$

$\frac{1}{3} \times \frac{1}{5}$

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

Practice Sheet Mild

Dividing fractions

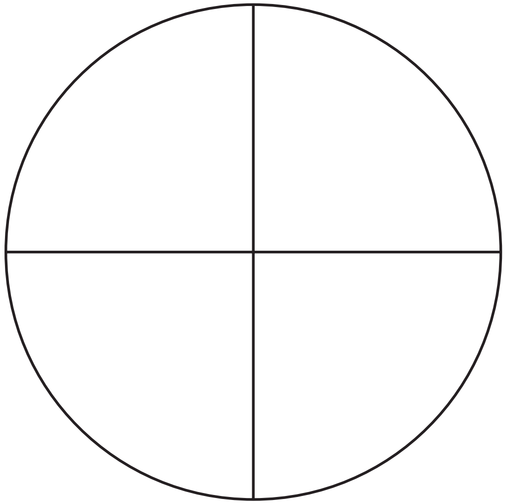


$\frac{1}{3} \div 2 =$

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

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

$\frac{2}{3} \div 4 =$

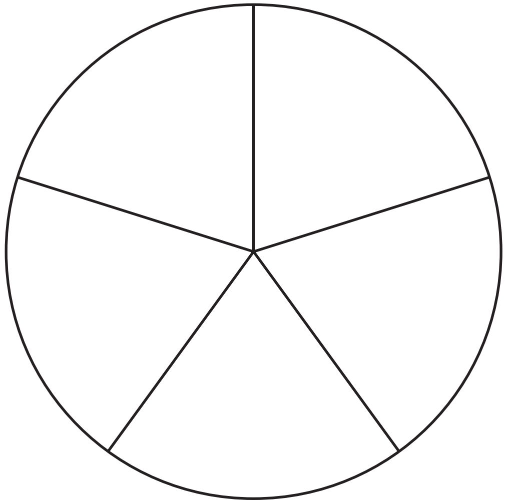


$\frac{1}{4} \div 2 =$

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

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

$\frac{3}{4} \div 2 =$



$\frac{1}{5} \div 2 =$

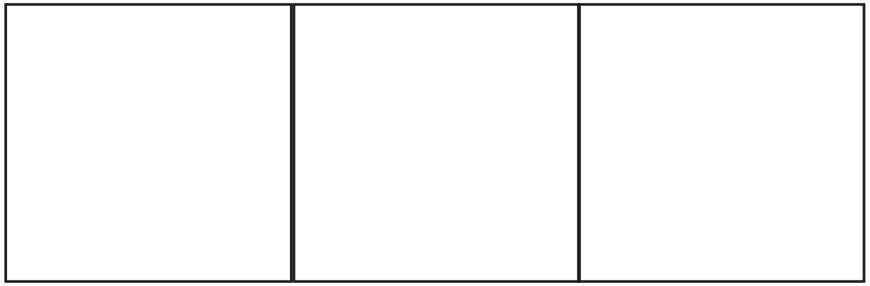
$\frac{2}{5} \div 2 =$

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

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

Practice Sheet Hot

Multiplying fractions

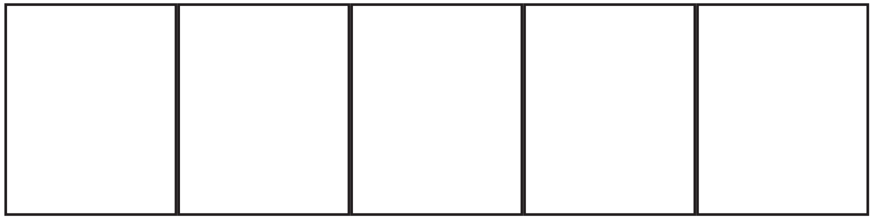


$\frac{1}{2} \times \frac{1}{3}$

$\frac{1}{2} \times \frac{2}{3}$

$\frac{1}{4} \times \frac{2}{3}$

$\frac{2}{3} \times \frac{2}{3}$



$\frac{1}{2} \times \frac{1}{5}$

$\frac{1}{3} \times \frac{1}{5}$

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

$\frac{1}{5} \times \frac{3}{5}$

Now try these:

$\frac{1}{3} \times \frac{3}{4}$

$\frac{2}{3} \times \frac{3}{4}$

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

$\frac{2}{5} \times \frac{1}{4}$

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

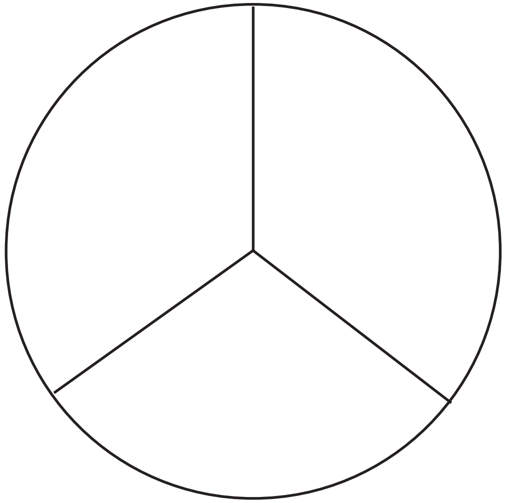
$\frac{3}{5} \times \frac{3}{4}$

Challenge

Write your own multiplications with an answer of $\frac{6}{15}$.

Practice Sheet Hot

Dividing fractions

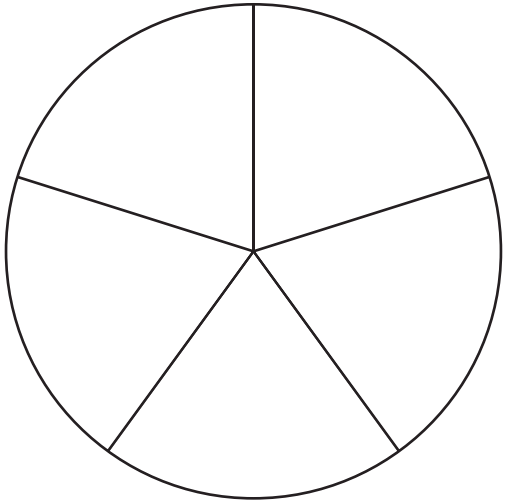


$\frac{1}{3} \div 2 =$

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

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

$\frac{2}{3} \div 4 =$



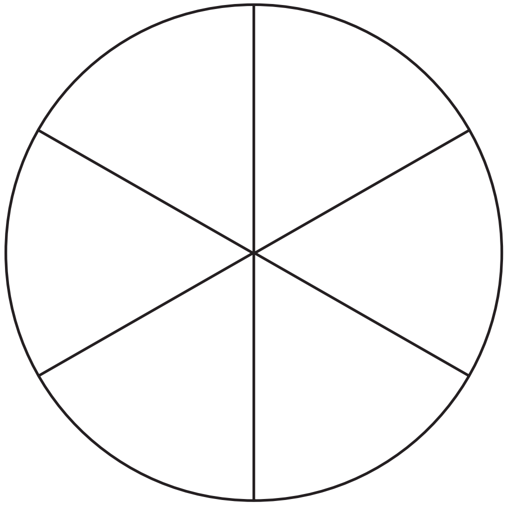
$\frac{1}{5} \div 3 =$

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

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

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

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



$\frac{1}{6} \div 2 =$

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

$\frac{5}{6} \div 2 =$

Extra Challenge

Multiply and divide fractions

1. $\frac{1}{2} \times \frac{1}{3}$
2. $\frac{1}{2} \times \frac{1}{4}$
3. $\frac{1}{3} \times \frac{1}{4}$
4. $\frac{1}{2} \times \frac{3}{4}$
5. $\frac{1}{2} \times \frac{4}{5}$
6. $\frac{1}{3} \times \frac{3}{4}$
7. $\frac{2}{3} \times \frac{3}{4}$
8. $\frac{1}{4} \times \frac{2}{3}$
9. $\frac{1}{4} \times \frac{2}{5}$
10. $\frac{1}{3} \div 2$
11. $\frac{1}{3} \div 3$
12. $\frac{1}{4} \div 2$
13. $\frac{1}{4} \div 4$
14. $\frac{2}{3} \div 4$
15. $\frac{1}{5} \div 2$
16. $\frac{2}{5} \div 4$
17. $\frac{3}{4} \div 3$
18. $\frac{2}{3} \div 4$

Practice Sheets Answers

Find fractions of fractions (mild)

$\frac{1}{2}$ of $\frac{1}{2}$ is $\frac{1}{4}$

$\frac{1}{3}$ of $\frac{1}{2}$ is $\frac{1}{6}$

$\frac{1}{4}$ of $\frac{1}{2}$ is $\frac{1}{8}$

$\frac{1}{2}$ of $\frac{1}{3}$ is $\frac{1}{6}$

$\frac{1}{3}$ of $\frac{1}{3}$ is $\frac{1}{9}$

$\frac{1}{4}$ of $\frac{1}{3}$ is $\frac{1}{12}$

$\frac{1}{2}$ of $\frac{1}{4}$ is $\frac{1}{8}$

$\frac{1}{3}$ of $\frac{1}{4}$ is $\frac{1}{12}$

$\frac{1}{4}$ of $\frac{1}{4}$ is $\frac{1}{16}$

$\frac{1}{2} \times \frac{1}{5} = \frac{1}{10}$
$\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$
$\frac{1}{2} \times \frac{1}{10} = \frac{1}{20}$
$\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$
$\frac{1}{3} \times \frac{1}{6} = \frac{1}{18}$

Dividing fractions (mild)

$\frac{1}{3} \div 2 = \frac{1}{6}$
$\frac{1}{3} \div 3 = \frac{1}{9}$
$\frac{2}{3} \div 2 = \frac{2}{6} = \frac{1}{3}$
$\frac{2}{3} \div 4 = \frac{2}{12} = \frac{1}{6}$

$\frac{1}{4} \div 2 = \frac{1}{8}$
$\frac{1}{4} \div 3 = \frac{1}{12}$
$\frac{3}{4} \div 3 = \frac{3}{12} = \frac{1}{4}$
$\frac{3}{4} \div 2 = \frac{3}{8}$

$\frac{1}{5} \div 2 = \frac{1}{10}$
$\frac{2}{5} \div 2 = \frac{2}{10} = \frac{1}{5}$
$\frac{2}{5} \div 4 = \frac{2}{20} = \frac{1}{10}$
$\frac{4}{5} \div 2 = \frac{4}{10} = \frac{2}{5}$

Multiplying fractions (hot)

$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$
$\frac{2}{3} \times \frac{2}{3} = \frac{4}{9}$
$\frac{1}{2} \times \frac{1}{5} = \frac{1}{10}$
$\frac{1}{5} \times \frac{3}{5} = \frac{3}{25}$
$\frac{1}{3} \times \frac{3}{4} = \frac{3}{12} = \frac{1}{4}$
$\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$

$\frac{1}{2} \times \frac{2}{3} = \frac{2}{6} = \frac{1}{3}$
$\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$
$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$
$\frac{5}{6} \times \frac{2}{3} = \frac{10}{18} = \frac{5}{9}$

$\frac{1}{4} \times \frac{2}{3} = \frac{2}{12} = \frac{1}{6}$
$\frac{2}{3} \times \frac{1}{5} = \frac{2}{15}$
$\frac{1}{5} \times \frac{1}{4} = \frac{1}{20}$
$\frac{3}{5} \times \frac{3}{4} = \frac{9}{20}$

Challenge

Accept answers where two fractions have been multiplied to give $\frac{6}{15}$*. e.g.*

$\frac{2}{3} \times \frac{3}{5}$ or $\frac{1}{5} \times \frac{6}{3} = \frac{6}{15}$

Dividing fractions (hot)

$\frac{1}{3} \div 2 = \frac{1}{6}$

$\frac{1}{3} \div 3 = \frac{1}{9}$

$\frac{2}{3} \div 2 = \frac{2}{6} = \frac{1}{3}$

$\frac{2}{3} \div 4 = \frac{2}{12} = \frac{1}{6}$

$\frac{1}{5} \div 3 = \frac{1}{15}$

$\frac{2}{5} \div 2 = \frac{2}{10} = \frac{1}{5}$

$\frac{2}{5} \div 4 = \frac{2}{20} = \frac{1}{10}$

$\frac{3}{5} \div 2 = \frac{3}{10}$

$\frac{4}{5} \div 2 = \frac{4}{10} = \frac{2}{5}$

$\frac{1}{6} \div 2 = \frac{1}{12}$

$\frac{1}{6} \div 3 = \frac{1}{18}$

$\frac{5}{6} \div 2 = \frac{5}{12}$

Multiply and divide fractions (Extra Challenge)

1. $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$
2. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$
3. $\frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$
4. $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$
5. $\frac{1}{2} \times \frac{4}{5} = \frac{2}{5}$
6. $\frac{1}{3} \times \frac{3}{4} = \frac{1}{4}$
7. $\frac{2}{3} \times \frac{3}{4} = \frac{1}{2}$
8. $\frac{1}{4} \times \frac{2}{3} = \frac{1}{6}$
9. $\frac{1}{4} \times \frac{2}{5} = \frac{1}{10}$
10. $\frac{1}{3} \div 2 = \frac{1}{6}$
11. $\frac{1}{3} \div 3 = \frac{1}{9}$
12. $\frac{1}{4} \div 2 = \frac{1}{8}$
13. $\frac{1}{4} \div 4 = \frac{1}{16}$
14. $\frac{2}{3} \div 4 = \frac{1}{6}$
15. $\frac{1}{5} \div 2 = \frac{1}{10}$
16. $\frac{2}{5} \div 4 = \frac{1}{10}$
17. $\frac{3}{4} \div 3 = \frac{1}{4}$
18. $\frac{2}{3} \div 4 = \frac{1}{6}$

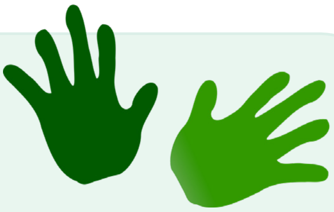
A Bit Stuck?

Folding fractions

Work in pairs

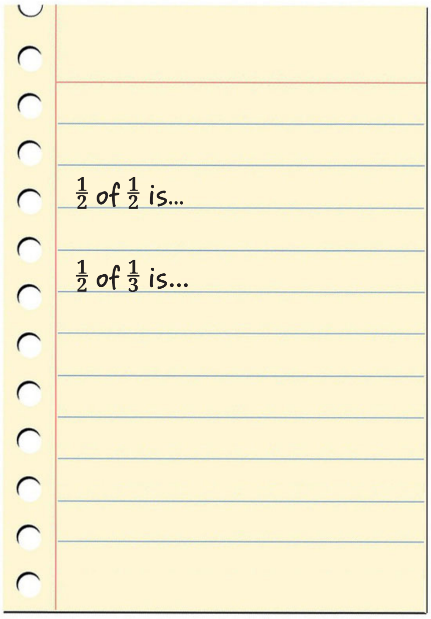
Things you will need:

- A set of shapes divided into fractions
- Coloured pencils
- A pencil



What to do:

- Quickly colour in $\frac{1}{2}$ of the circle.
- Now fold the circle in half so each half is split in half.
  $\frac{1}{2}$ of $\frac{1}{2}$ is ______.
- Quickly colour in $\frac{1}{3}$ of the square.
- Now fold the square so that each third is split in half. $\frac{1}{2}$ of $\frac{1}{3}$ is _____.
- Choose one of the rectangles.
  What fraction is each part?
  Quickly colour one part.
- Fold the rectangle so that each part is split in half.
  Write the matching halving statement.
- Repeat for at least two more rectangles.



$\frac{1}{2}$ of $\frac{1}{2}$ is...

$\frac{1}{2}$ of $\frac{1}{3}$ is...

S-t-r-e-t-c-h:

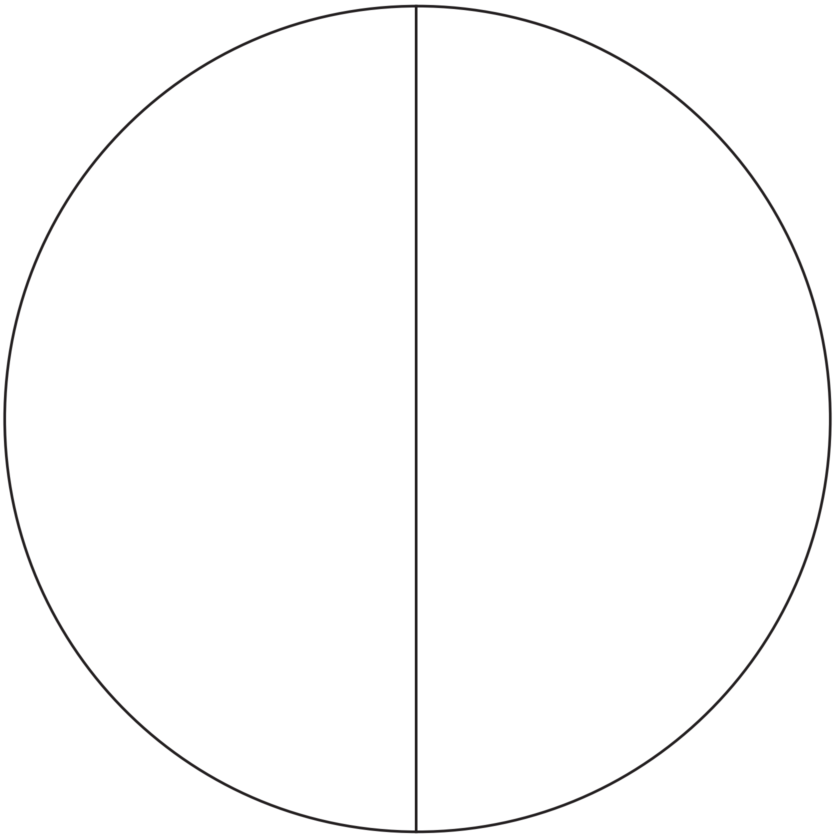
Use folded shapes to find $\frac{1}{2}$ of $\frac{3}{8}$ and $\frac{1}{2}$ of $\frac{5}{6}$.

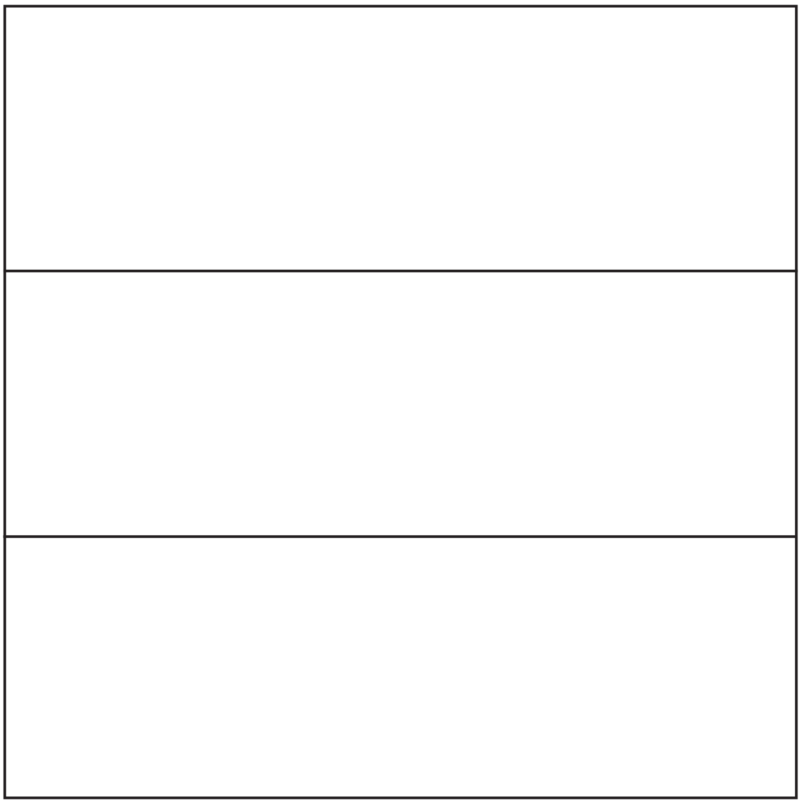
Learning outcomes:

- I can find half of unit fractions.
- I am beginning to find half of non-unit fractions.

A Bit Stuck?

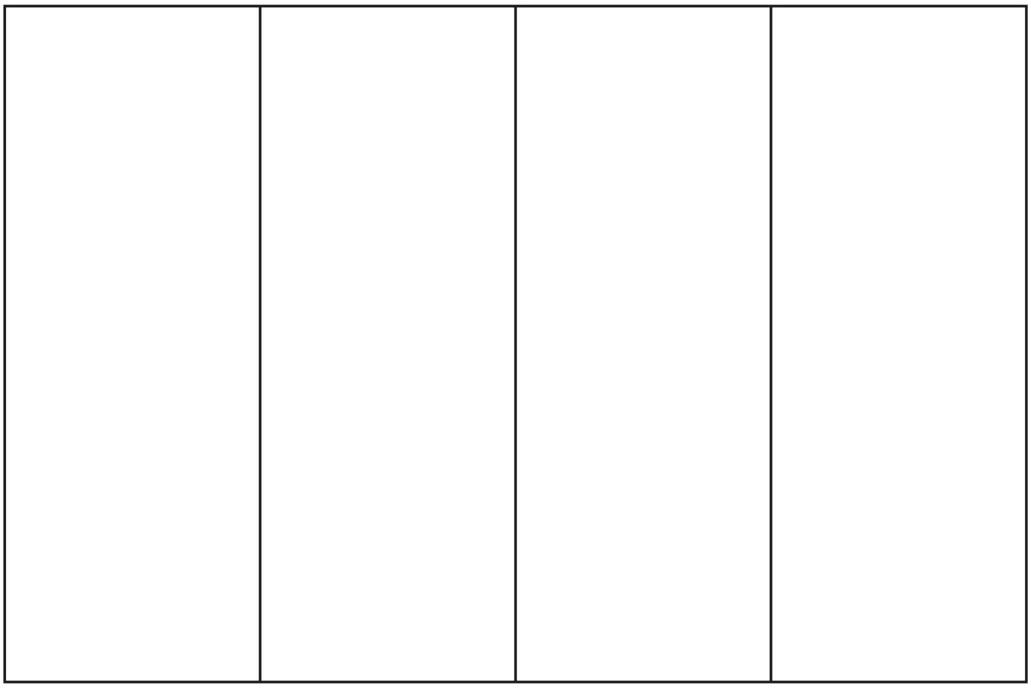
Folding fractions

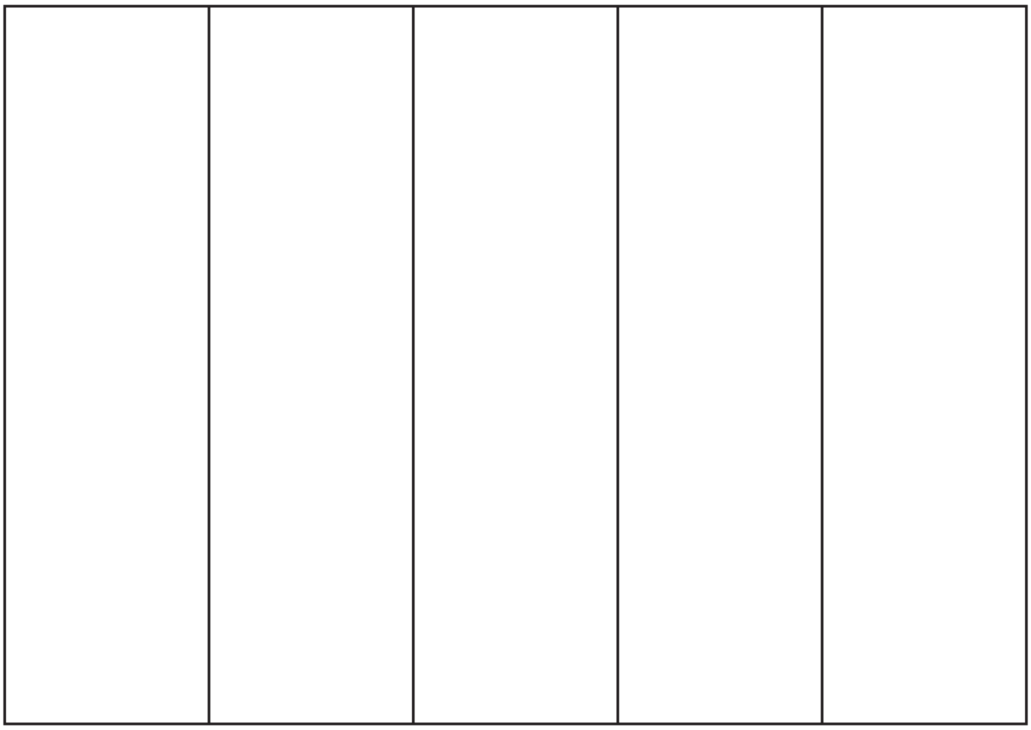




A Bit Stuck?

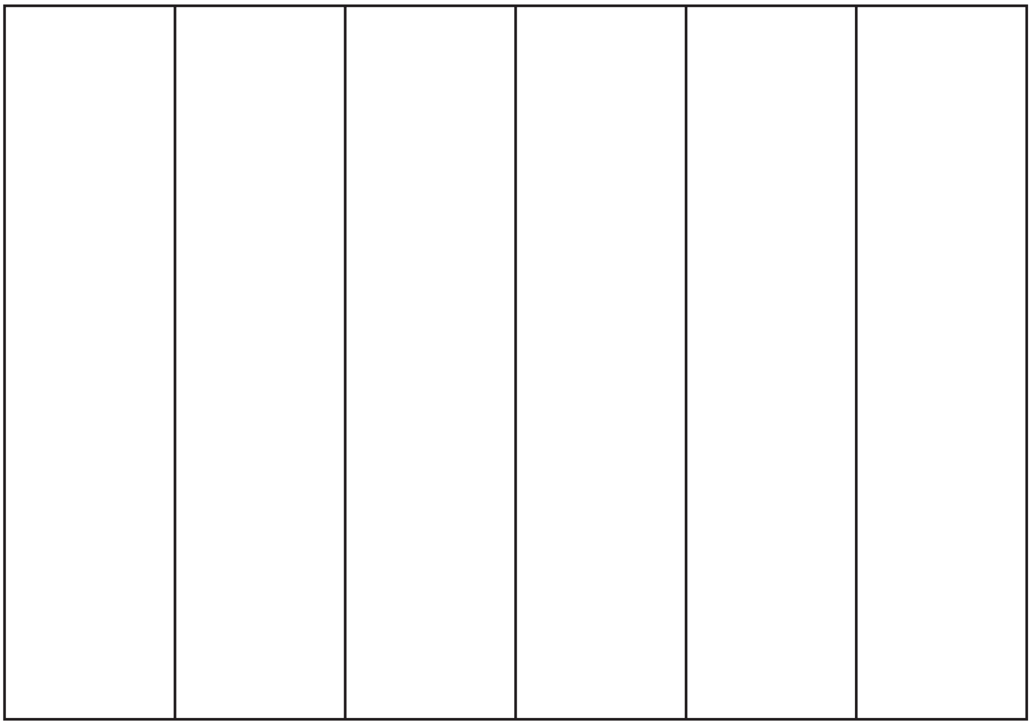
Folding fractions

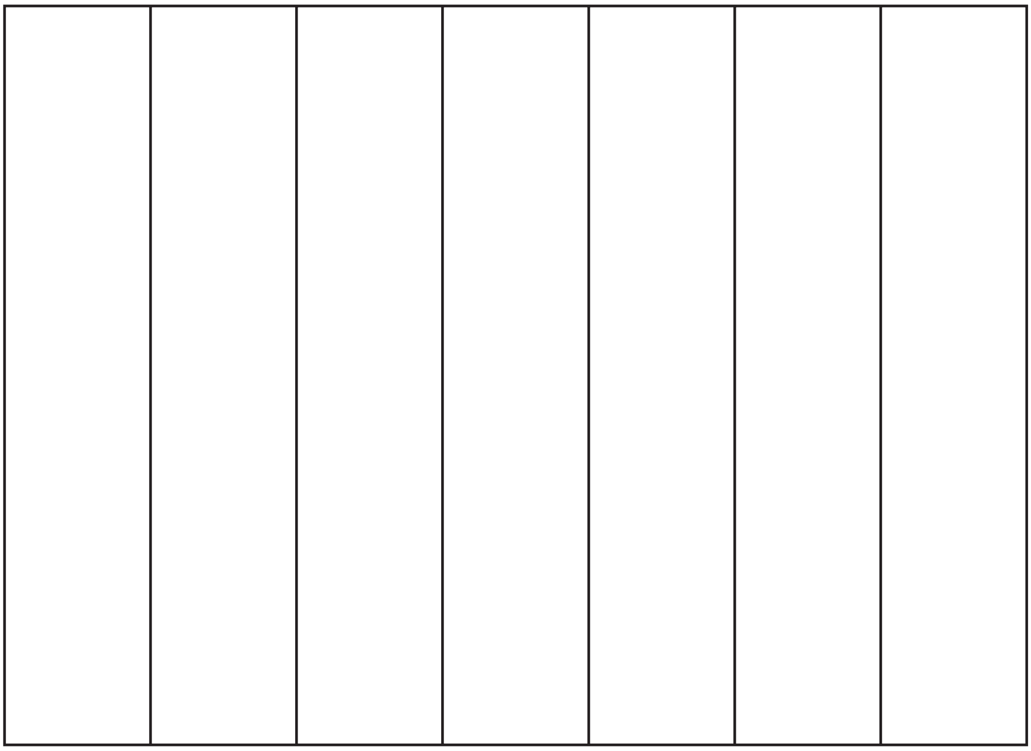




A Bit Stuck?

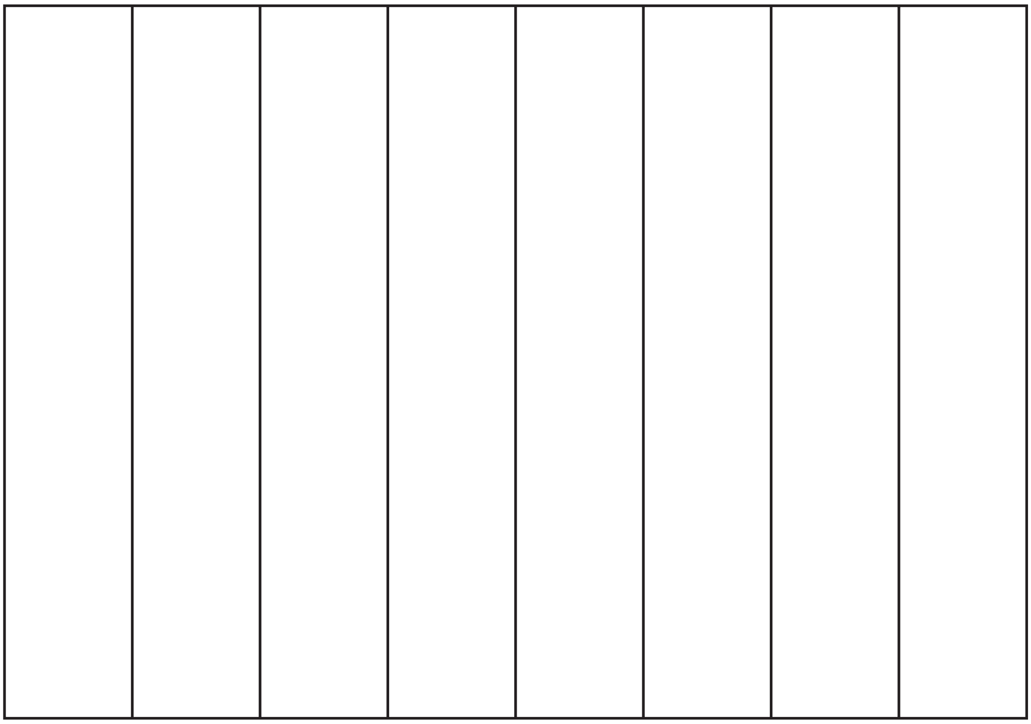
Folding fractions

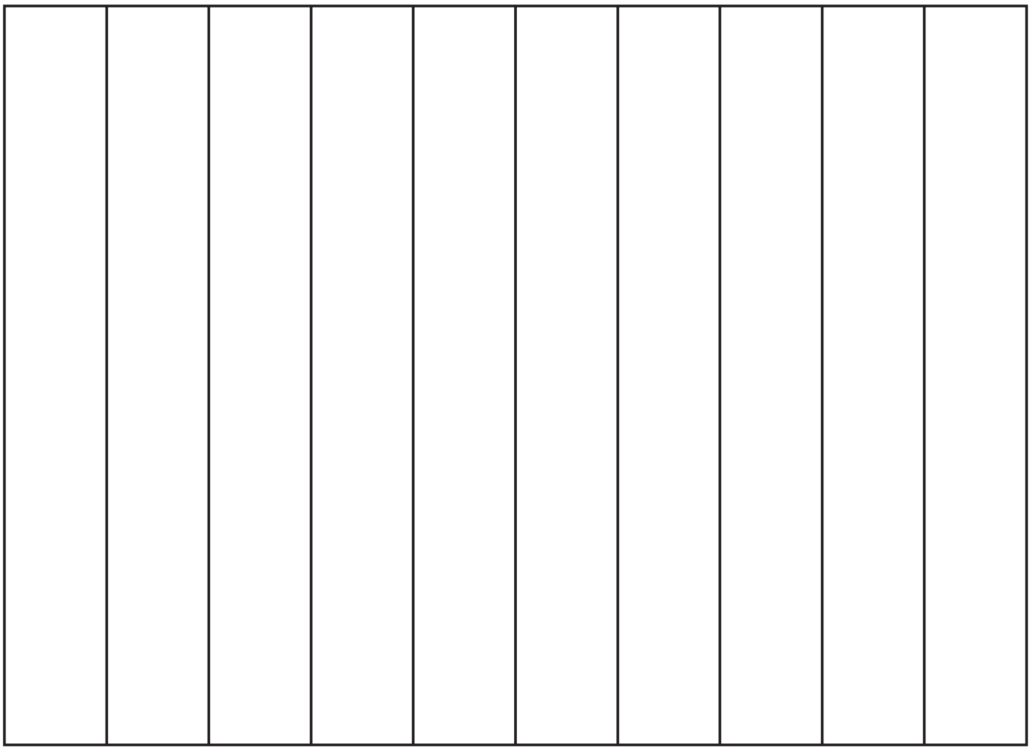




A Bit Stuck?

Folding fractions





Check your understanding

Questions

Find one quarter of…

(a) $^{1}/_{3}$
(b) $^{2}/_{5}$
(c) $^{3}/_{8}$
.

A large cake is divided into ten equal pieces.
One piece is split into thirds. What fraction is each smaller piece?
Another piece is split into quarters. What fraction is each of these smaller pieces?

We divide a quarter of a pie into five pieces.

What fraction is each piece?

Fold here to hide answers:

Check your understanding

Answers

Find one quarter of…

(d) $^{1}/_{3}$ $^{1}/_{12}$
(e) $^{2}/_{5}$ $^{2}/_{20}$ or $^{1}/_{10}$
(f) $^{3}/_{8}$ $^{3}/_{32}$
.

A large cake is divided into ten equal pieces.
One piece is split into thirds. What fraction is each smaller piece? **$^{1}/_{30}$**
Another piece is split into quarters. What fraction is each of these smaller pieces? **$^{1}/_{40}$**

We divide a quarter of a pie into five pieces. What fraction is each piece?

$^{1}/_{20}$ Note in this and all of the previous questions that multiplying by a fraction results in a smaller fraction