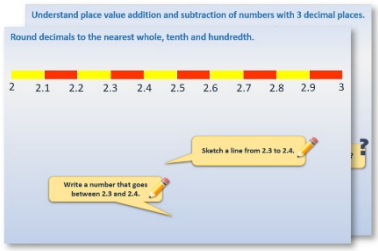
Year 6: Week 2, Day 3
Multiply and divide fractions

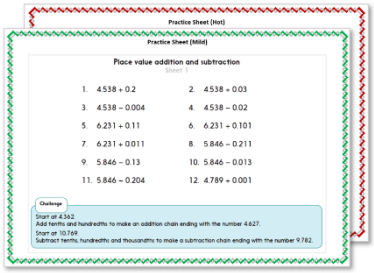
Each day covers one maths topic. It should take you about 1 hour or just a little more.

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



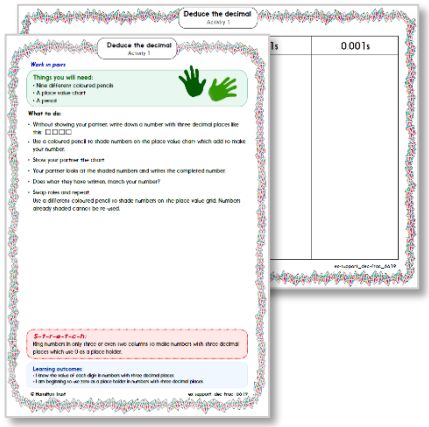
---

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



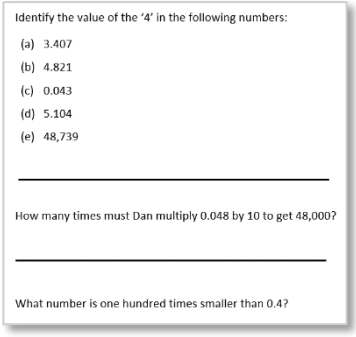
---

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



---

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



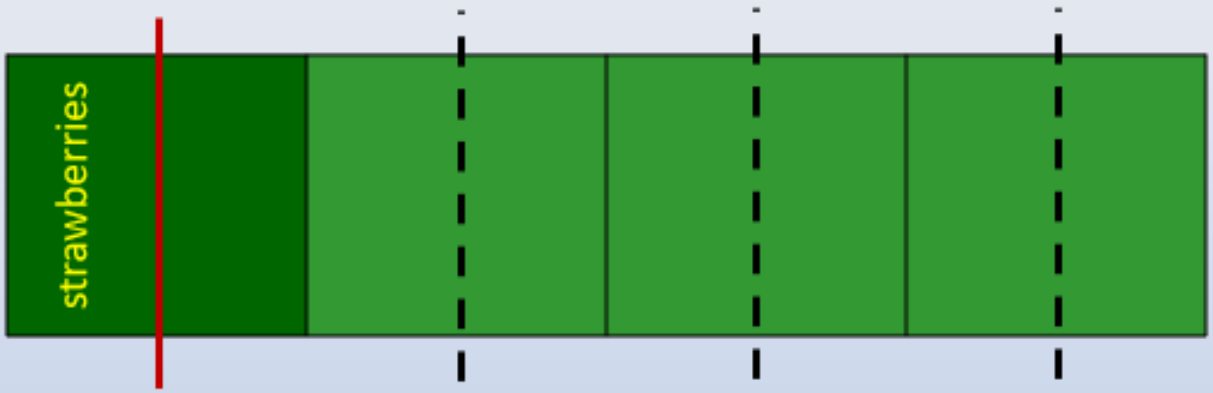
© Hamilton Trust

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?



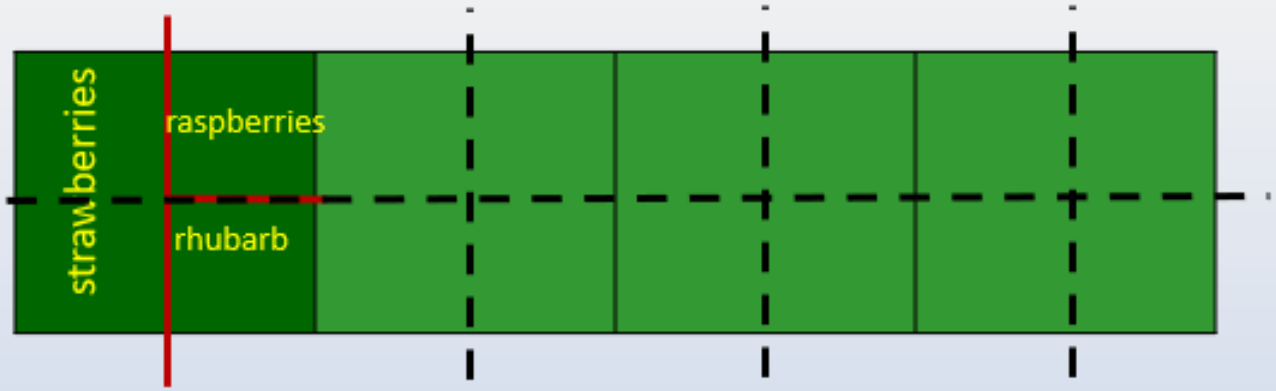
$^1/_2 \times {}^1/_4 = {}^1/_8$ strawberries

© Hamilton Trust

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?

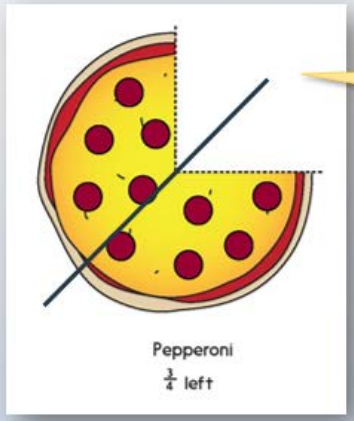
We can calculate a quarter of a quarter by finding

$$^1/_4 \times {}^1/_4 = {}^1/_{16}$$

© Hamilton Trust

Learning Reminders

Divide fractions by whole numbers.



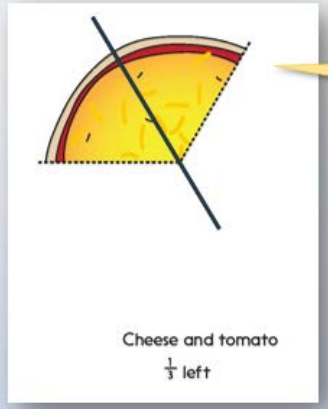
Two children are going to share what's left of the pepperoni pizza.

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?

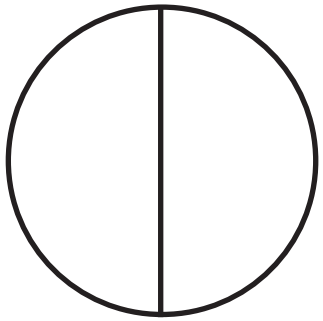
$$^2/_3 \div 2 = {}^1/_3$$

© Hamilton Trust

Practice Sheet Mild

Find fractions of fractions

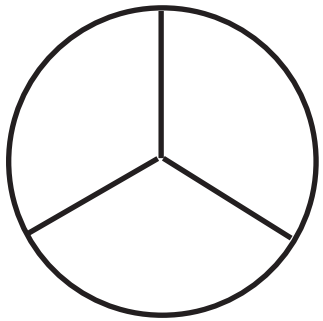
Calculate the fractions of these fractions for each circle. What do you notice about the denominators of your answers?



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

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

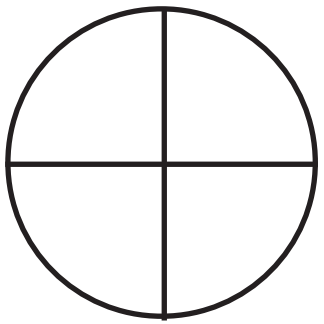
$\frac{1}{4}$ of $\frac{1}{2}$ is



$\frac{1}{2}$ 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:

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

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

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

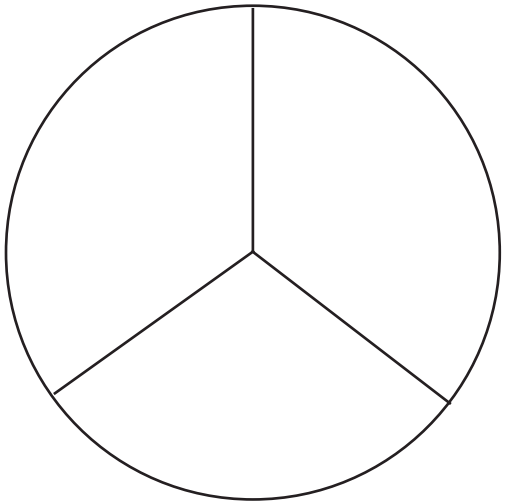
$\frac{1}{3} \times \frac{1}{5}$

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

© Hamilton Trust

Practice Sheet Mild

Dividing fractions

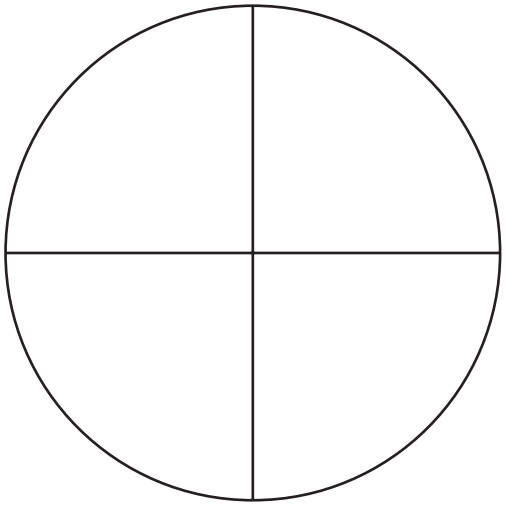


$\frac{1}{3} \div 2 =$

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

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

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

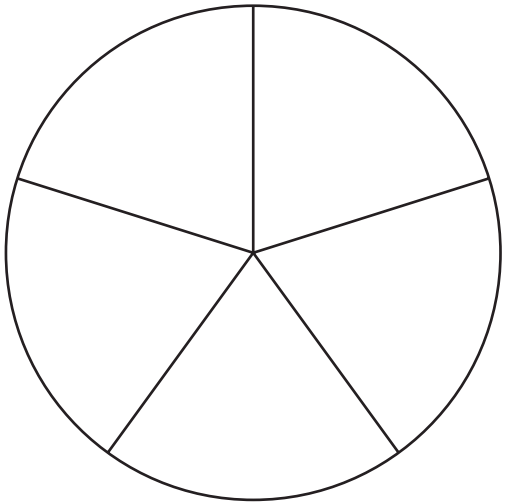


$\frac{1}{4} \div 2 =$

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

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

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



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

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

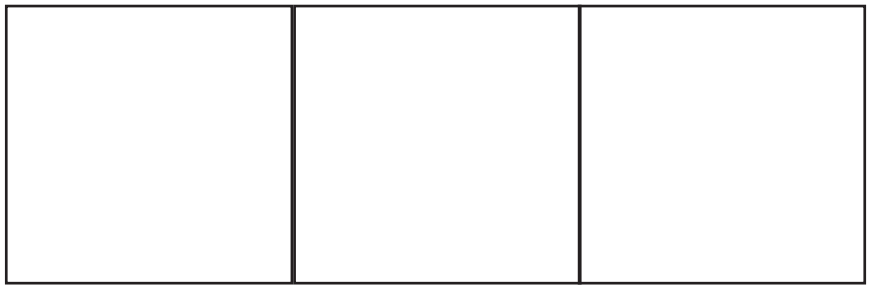
$\frac{2}{5} \div 4 =$

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

© Hamilton Trust

Practice Sheet Hot

Multiplying fractions

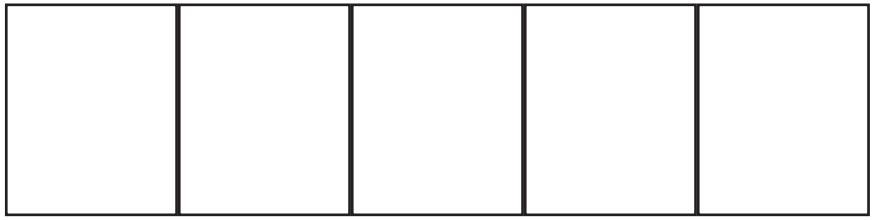


$\frac{1}{2} \times \frac{1}{3}$

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

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

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



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

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

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

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

Now try these:

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

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

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

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

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

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

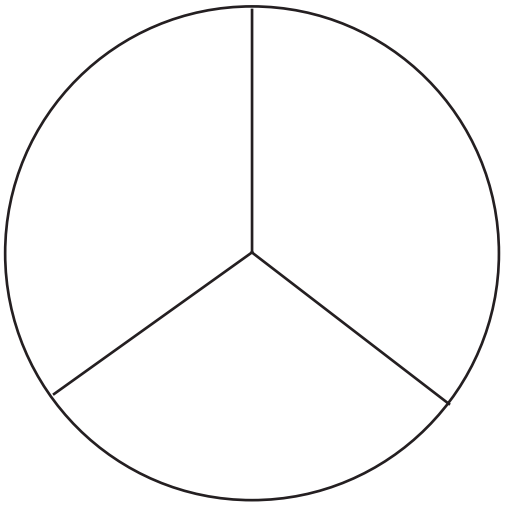
Challenge

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

© Hamilton Trust

Practice Sheet Hot

Dividing fractions

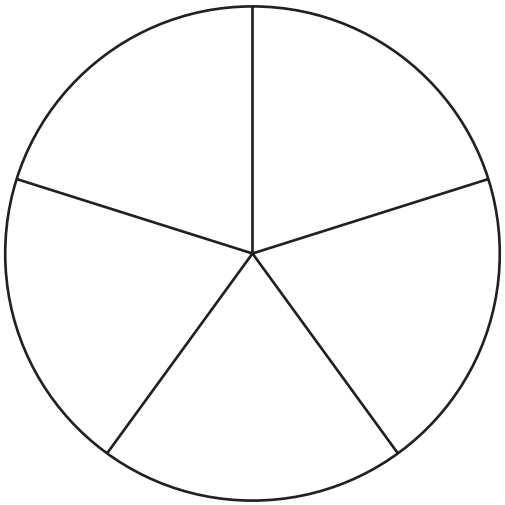


$\frac{1}{3} \div 2 =$

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

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

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



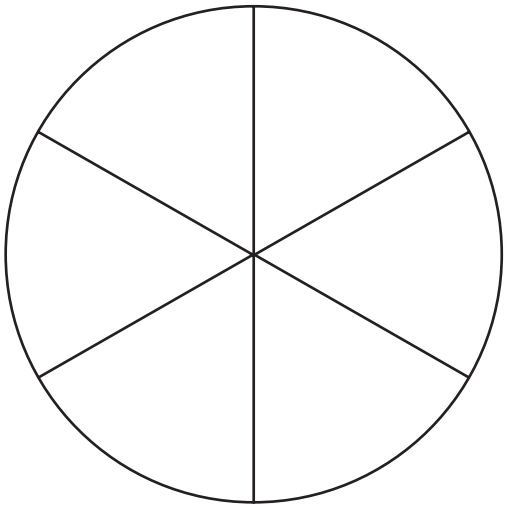
$\frac{1}{5} \div 3 =$

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

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

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

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



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

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

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

© Hamilton Trust

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

© Hamilton Trust

Practice Sheets Answers

Find fractions of fractions (mild)

$\frac{1}{2}$ of $\frac{1}{2}$ is $\frac{1}{4}$ | $\frac{1}{2}$ of $\frac{1}{3}$ is $\frac{1}{6}$ | $\frac{1}{2}$ of $\frac{1}{4}$ is $\frac{1}{8}$

$\frac{1}{3}$ of $\frac{1}{2}$ is $\frac{1}{6}$ | $\frac{1}{3}$ of $\frac{1}{3}$ is $\frac{1}{9}$ | $\frac{1}{3}$ of $\frac{1}{4}$ is $\frac{1}{12}$

$\frac{1}{4}$ of $\frac{1}{2}$ is $\frac{1}{8}$ | $\frac{1}{4}$ of $\frac{1}{3}$ 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)

$\frac{1}{3} \div 2 = \frac{1}{6}$ | $\frac{1}{4} \div 2 = \frac{1}{8}$ | $\frac{1}{5} \div 2 = \frac{1}{10}$
$\frac{1}{3} \div 3 = \frac{1}{9}$ | $\frac{1}{4} \div 3 = \frac{1}{12}$ | $\frac{2}{5} \div 2 = \frac{2}{10} = \frac{1}{5}$
$\frac{2}{3} \div 2 = \frac{2}{6} = \frac{1}{3}$ | $\frac{3}{4} \div 3 = \frac{3}{12} = \frac{1}{4}$ | $\frac{2}{5} \div 4 = \frac{2}{20} = \frac{1}{10}$
$\frac{2}{3} \div 4 = \frac{2}{12} = \frac{1}{6}$ | $\frac{3}{4} \div 2 = \frac{3}{8}$ | $\frac{4}{5} \div 2 = \frac{4}{10} = \frac{2}{5}$

Multiplying fractions (hot)

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

$\frac{1}{2} \times \frac{1}{5} = \frac{1}{10}$ | $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$ | $\frac{2}{3} \times \frac{1}{5} = \frac{2}{15}$
$\frac{1}{5} \times \frac{3}{5} = \frac{3}{25}$

$\frac{1}{3} \times \frac{3}{4} = \frac{3}{12} = \frac{1}{4}$ | $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$ | $\frac{1}{5} \times \frac{1}{4} = \frac{1}{20}$
$\frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$ | $\frac{5}{6} \times \frac{2}{3} = \frac{10}{18} = \frac{5}{9}$ | $\frac{3}{5} \times \frac{3}{4} = \frac{9}{20}$

Challenge

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

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

© Hamilton Trust

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)

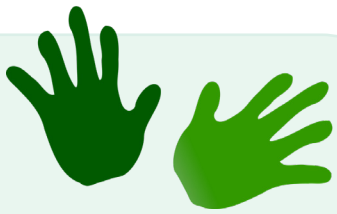
1. $\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$
2. $\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$
3. $\frac{1}{3} \times \frac{1}{4} = \frac{1}{12}$
4. $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$
5. $\frac{1}{2} \times \frac{4}{5} = \frac{2}{5}$
6. $\frac{1}{3} \times \frac{3}{4} = \frac{1}{4}$
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. $\frac{2}{3} \div 4 = \frac{1}{6}$

© Hamilton Trust

A Bit Stuck?
Folding fractions

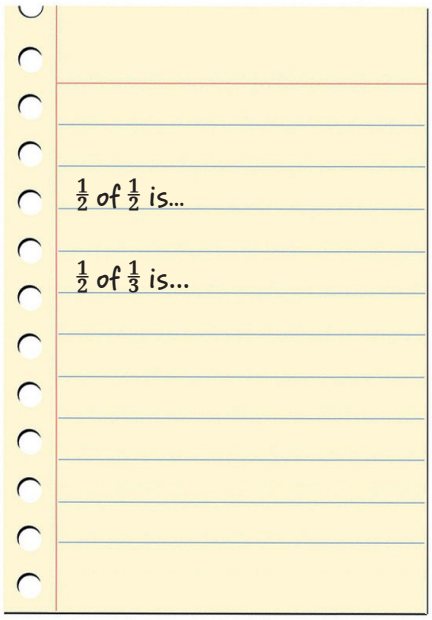
Work in pairs

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.

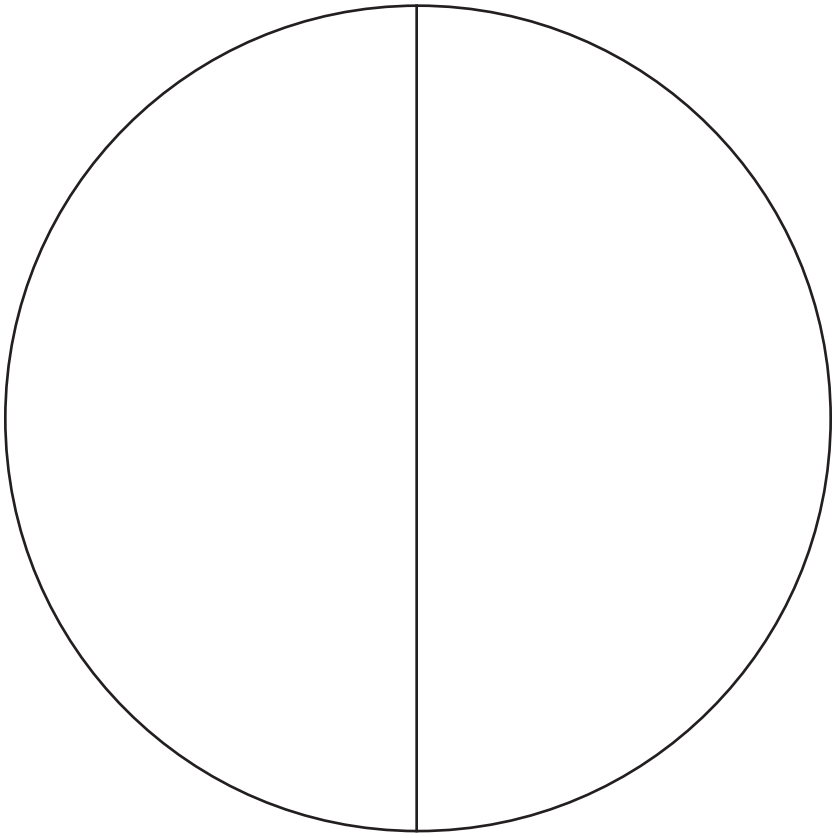


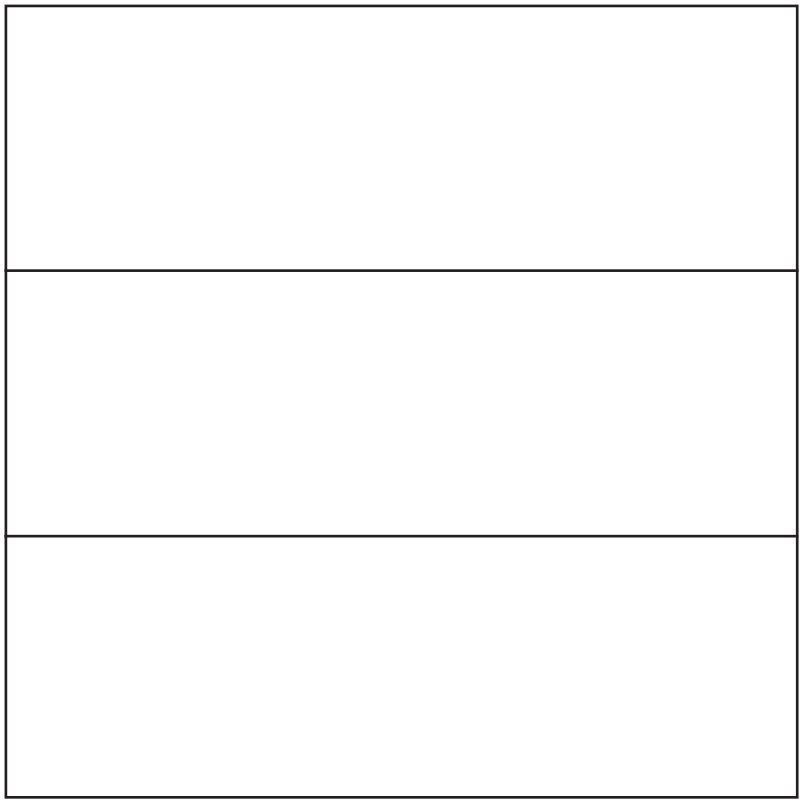
S-t-r-e-t-c-h:
Use folded shapes to find $\frac{1}{2}$ of $\frac{3}{8}$ and $\frac{1}{2}$ of $\frac{5}{6}$.

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

© Hamilton Trust

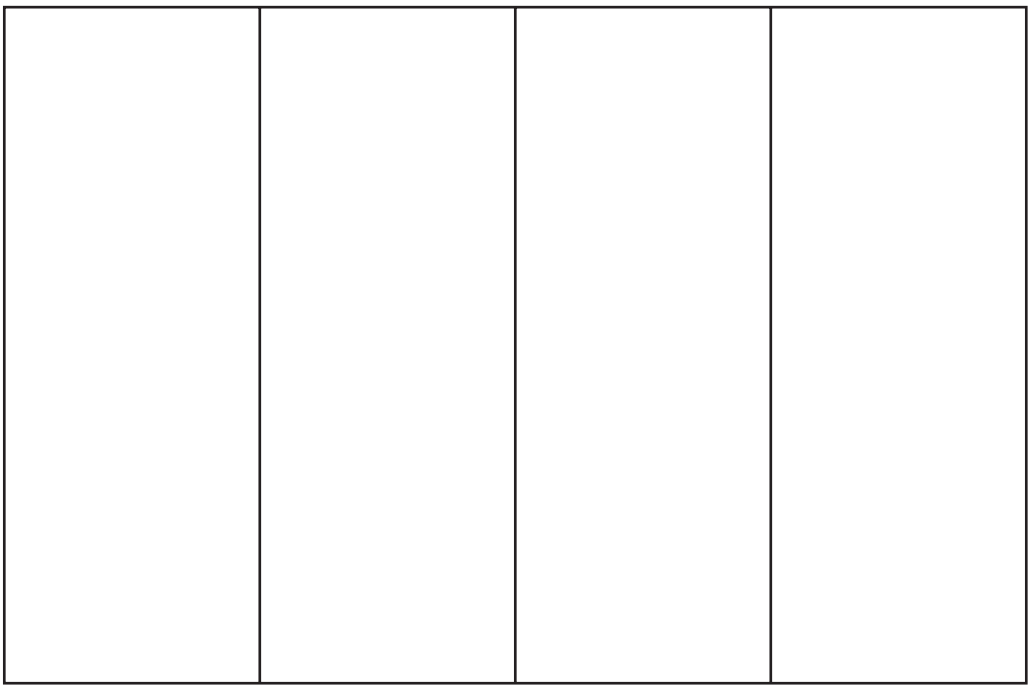
A Bit Stuck?
Folding fractions

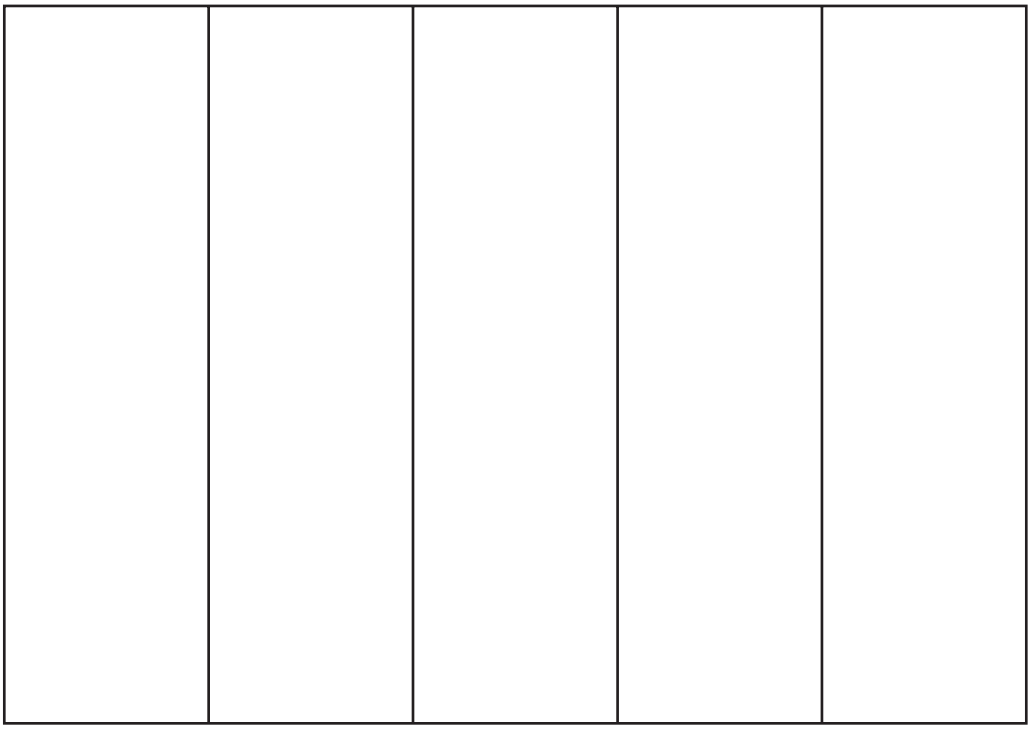




© Hamilton Trust

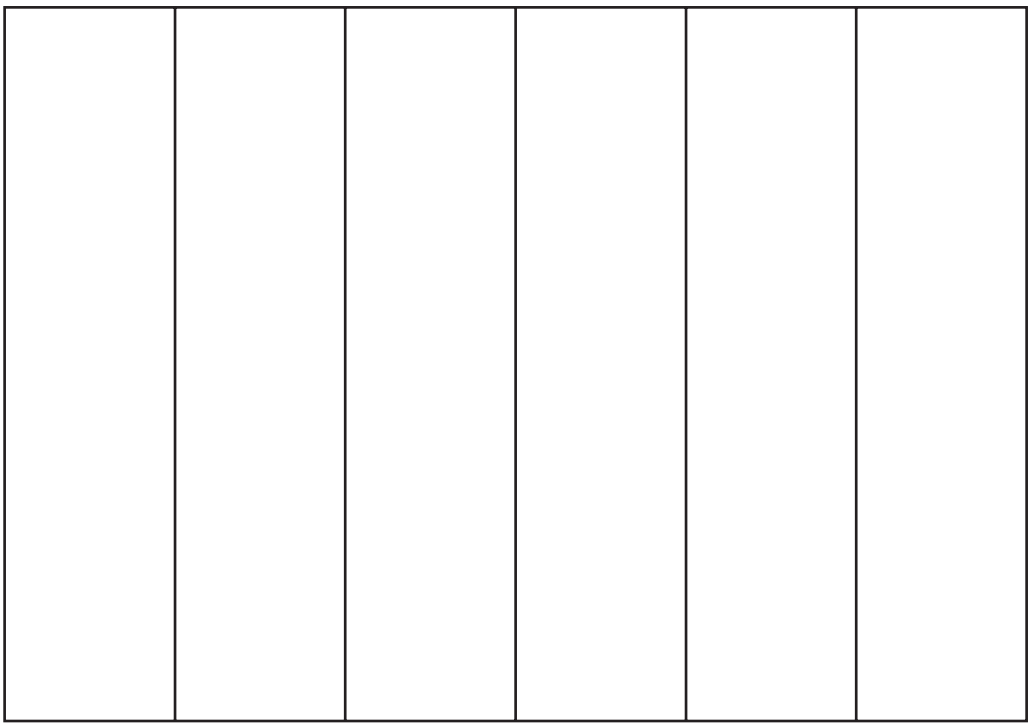
A Bit Stuck?
Folding fractions

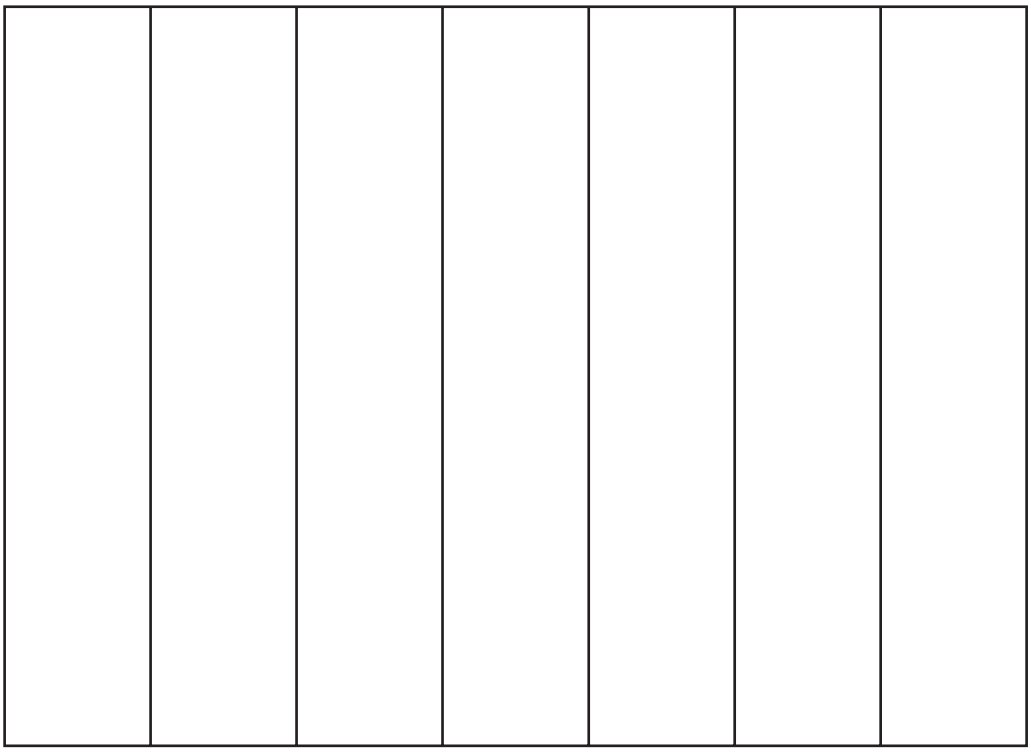




© Hamilton Trust

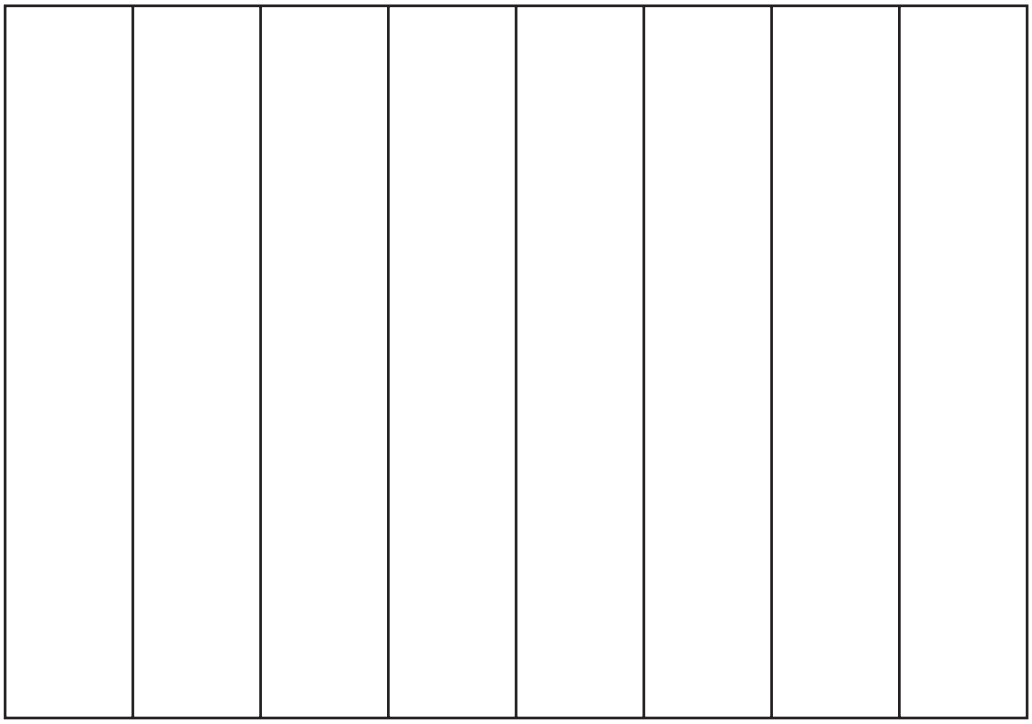
A Bit Stuck?
Folding fractions

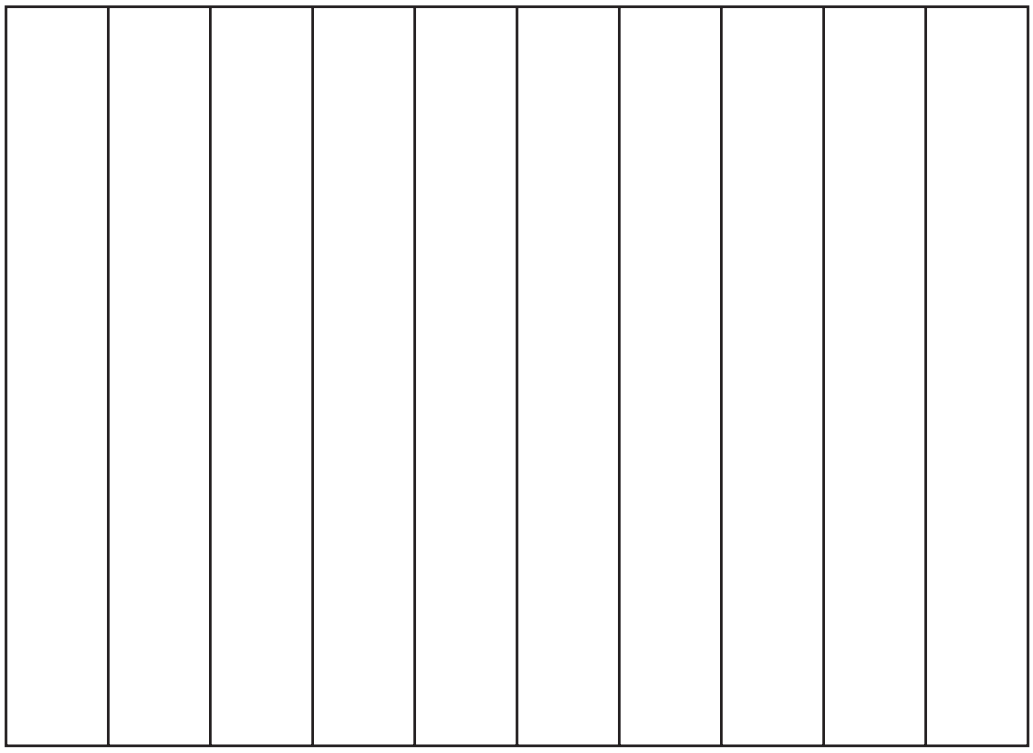




© Hamilton Trust

A Bit Stuck?
Folding fractions





© Hamilton Trust

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

© Hamilton Trust