



Fractions



Copyright © 2009 3P Learning. All rights reserved.

First edition printed 2009 in Australia.

A catalogue record for this book is available from 3P Learning Ltd.

ISBN 978-1-921860-69-0

Ownership of content The materials in this resource, including without limitation all information, text, graphics, advertisements, names, logos and trade marks (Content) are protected by copyright, trade mark and other intellectual property laws unless expressly indicated otherwise.

You must not modify, copy, reproduce, republish or distribute this Content in any way except as expressly provided for in these General Conditions or with our express prior written consent.

Copyright Copyright in this resource is owned or licensed by us. Other than for the purposes of, and subject to the conditions prescribed under, the Copyright Act 1968 (Cth) and similar legislation which applies in your location, and except as expressly authorised by these General Conditions, you may not in any form or by any means: adapt, reproduce, store, distribute, print, display, perform, publish or create derivative works from any part of this resource; or commercialise any information, products or services obtained from any part of this resource.

Where copyright legislation in a location includes a remunerated scheme to permit educational institutions to copy or print any part of the resource, we will claim for remuneration under that scheme where worksheets are printed or photocopied by teachers for use by students, and where teachers direct students to print or photocopy worksheets for use by students at school. A worksheet is a page of learning, designed for a student to write on using an ink pen or pencil. This may lead to an increase in the fees for educational institutions to participate in the relevant scheme.

Published 3P Learning Ltd

For more copies of this book, contact us at: www.3plearning.com/contact

Designed 3P Learning Ltd

Although every precaution has been taken in the preparation of this book, the publisher and authors assume no responsibility for errors or omissions. Neither is any liability assumed for damages resulting from the use of this information contained herein.

Series E – Fractions

Contents

Section 1 – Answers (pp. 1–32)

- working with fractions _____ 1
- types of fractions _____ 12
- fractions, decimals and percentages _____ 24

Section 2 – Assessment with answers (pp. 33–42)

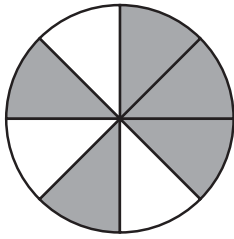
- working with fractions _____ 33
- types of fractions _____ 39
- fractions, decimals and percentages _____ 41

Series Author:

Nicola Herringer

Working with fractions – modelling fractions

A fraction is a part of a whole. This circle had been divided into 8 pieces and has 5 pieces shaded.

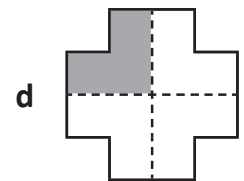
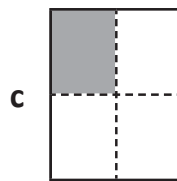
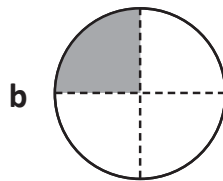
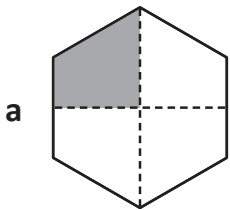


$$\frac{5}{8} = \frac{5 \text{ shaded parts}}{8 \text{ parts altogether}}$$

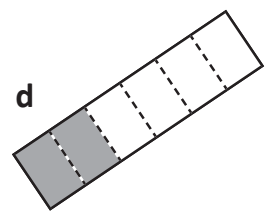
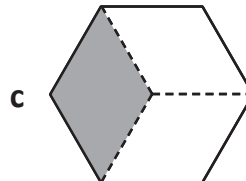
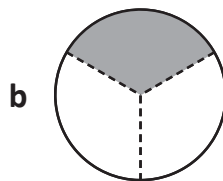
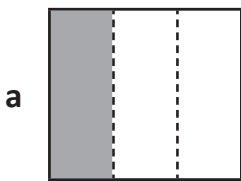


The top number is the numerator, the bottom number is the denominator.

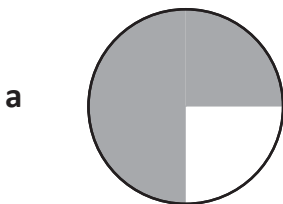
1 Divide each shape into quarters. Shade one quarter:



2 Shade one third on each shape:



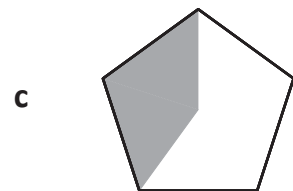
3 What fraction is shaded?



Fraction shaded $\frac{3}{4}$

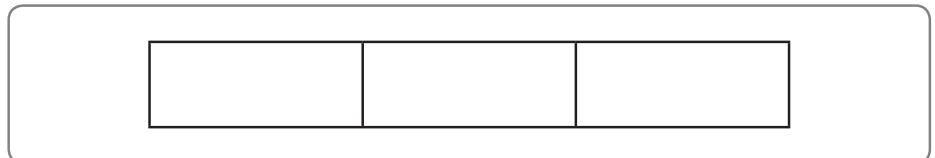


Fraction shaded $\frac{2}{6}$



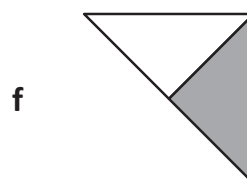
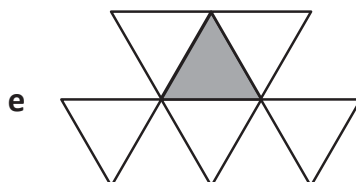
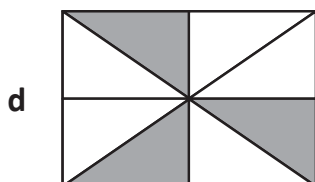
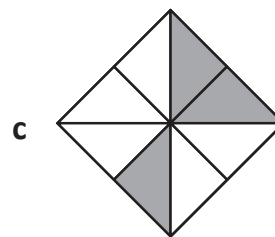
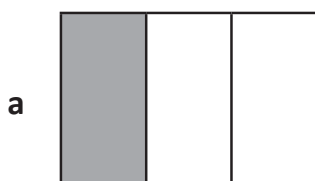
Fraction shaded $\frac{2}{5}$

4 If this is $\frac{1}{3}$ of a shape, what does the whole shape look like?

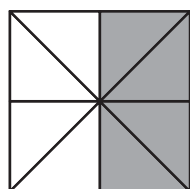


Working with fractions – modelling fractions

5 Complete the table for each shape.



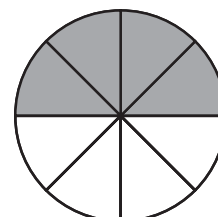
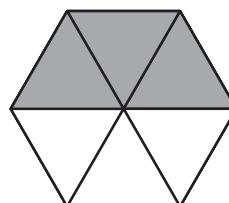
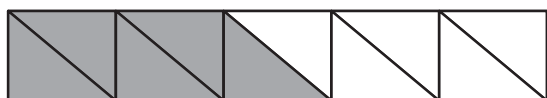
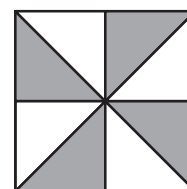
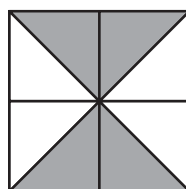
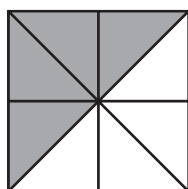
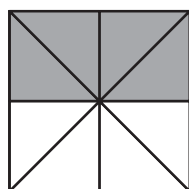
Shape	a	b	c	d	e	f
Fraction that is shaded	$\frac{1}{3}$	$\frac{7}{10}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{6}$	$\frac{1}{2}$
Fraction that is unshaded	$\frac{2}{3}$	$\frac{3}{10}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{6}$	$\frac{1}{2}$



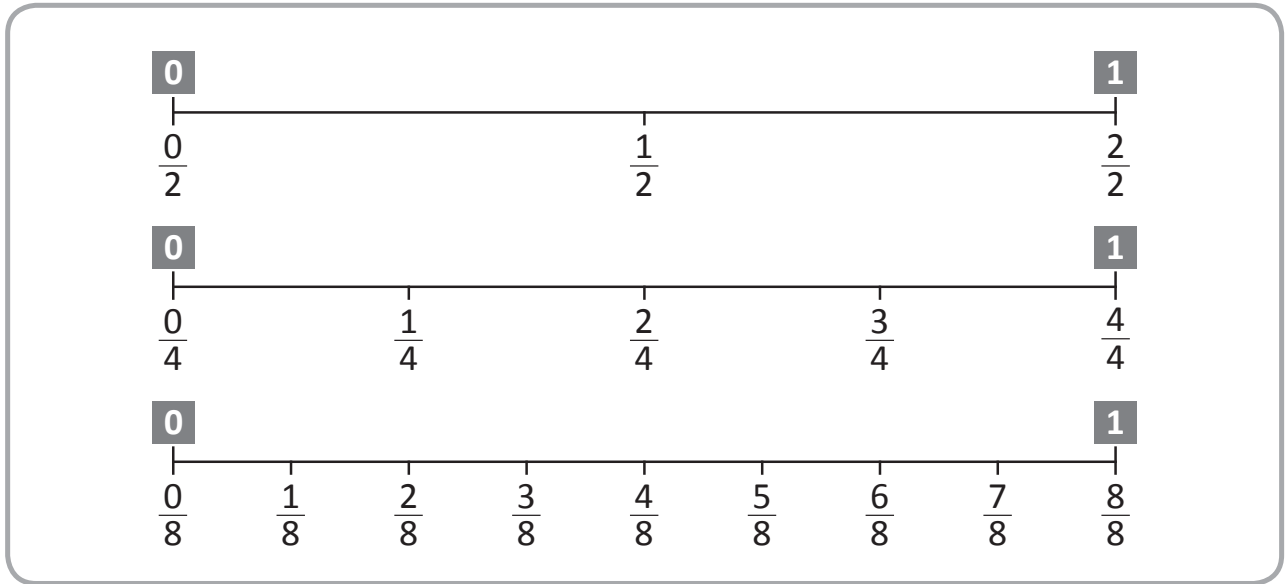
This shape has 8 pieces. To show half, I have shaded 4 pieces.

6 How many different ways can you show a half?

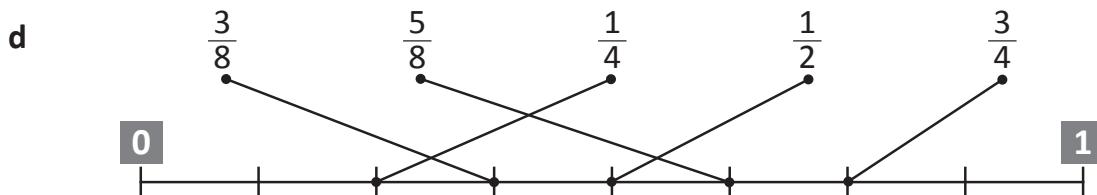
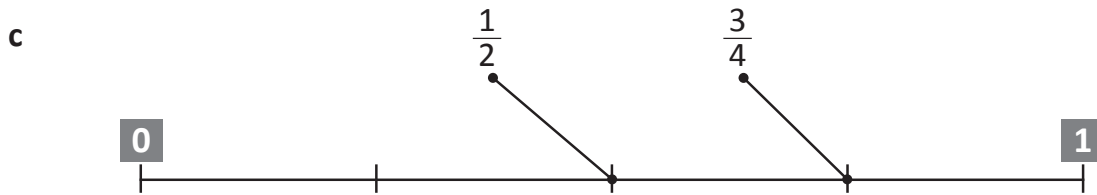
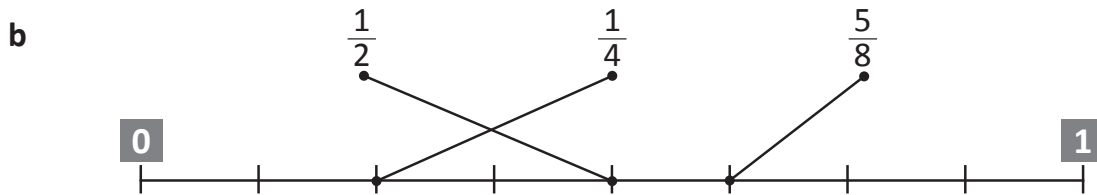
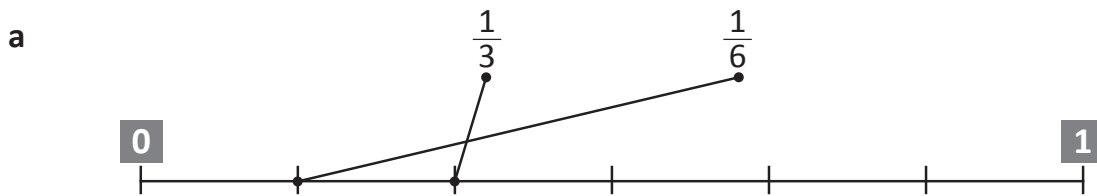
Answers will vary.



Working with fractions – comparing and ordering fractions

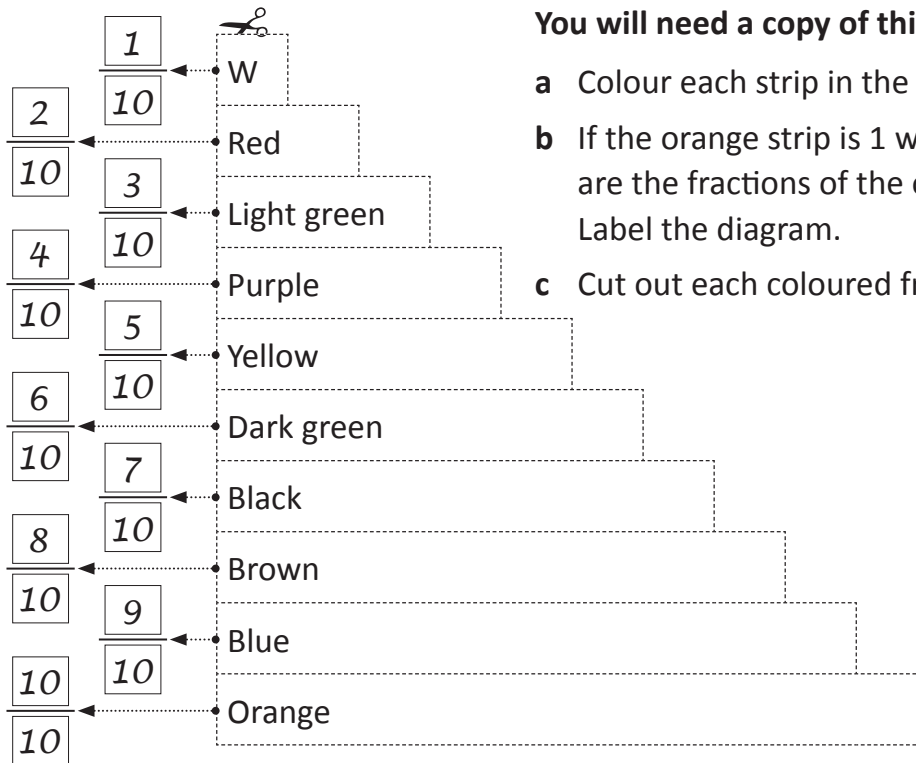


1 Connect the fractions to their places on the number lines.



Working with fractions – comparing and ordering fractions

2



You will need a copy of this page.



- a Colour each strip in the diagram.
- b If the orange strip is 1 whole, what are the fractions of the other strips? Label the diagram.
- c Cut out each coloured fraction strip.

3 Use the fraction strips that you have cut and coloured to answer these:

a If purple is $\frac{1}{2}$, which colour is 1 whole? Brown

b If red is $\frac{1}{4}$, which colour is 1 whole? Brown

c If blue is 1 whole, which colour is $\frac{1}{3}$? Light green

d If I connected purple and dark green together and they equalled 1 whole, what is the value of each?

Purple = $\frac{4}{10}$

Dark green = $\frac{6}{10}$

e If I connected red, light green and purple and they equalled 1 whole, what is the value of each?

Red = $\frac{2}{9}$

Light green = $\frac{3}{9}$

Purple = $\frac{4}{9}$

Working with fractions – comparing and ordering fractions

4 If the purple strip is equal to 1 whole, what fractions would these strips now be:

a Light green $\frac{3}{4}$

b Red $\frac{1}{2}$

c White $\frac{1}{4}$

5 If the brown strip is equal to 1 whole, what fractions would these strips now be:

a Purple $\frac{1}{2}$

b White $\frac{1}{8}$

c Red $\frac{1}{4}$

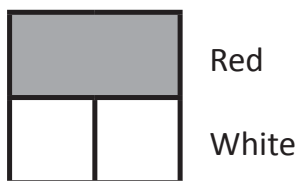
6 If the dark green strip is equal to 1 whole, what fractions would these strips now be:

a Yellow $\frac{5}{6}$

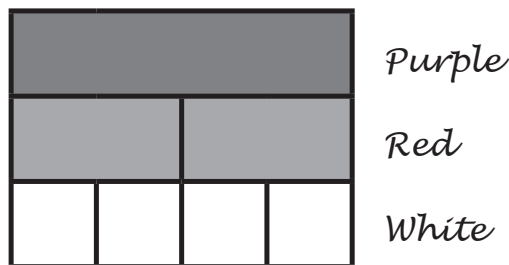
b Light green $\frac{3}{6}$ or $\frac{1}{2}$

c White $\frac{1}{6}$

7 This picture shows halves. The red strip is 1 and each white strip is $\frac{1}{2}$.

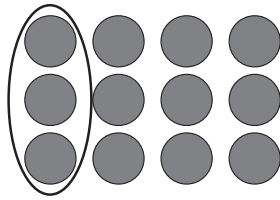


a Use your strips to create a picture that shows a whole, halves and quarters. First choose a strip that is equal to 1 whole, then choose different colours for the halves and the quarters. Paste your strips in the space below:



Working with fractions – fractions of a collection

Finding a fraction of different amounts is like division. Look at this array of dots. Finding one quarter is the same as dividing 12 by 4.

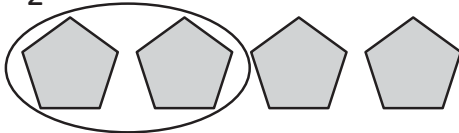


$$12 \div 4 = 3$$

$$\frac{1}{4} \text{ of } 12 = 3$$

1 Circle the fraction given for each group and complete the statements:

a $\frac{1}{2}$ of 4 pentagons



$$\boxed{4} \div \boxed{2} = \boxed{2}$$

$$\frac{1}{2} \text{ of } \boxed{4} = \boxed{2}$$

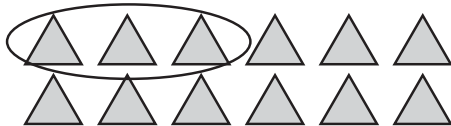
b $\frac{1}{4}$ of 8 stars



$$\boxed{8} \div \boxed{4} = \boxed{2}$$

$$\frac{1}{4} \text{ of } \boxed{8} = \boxed{2}$$

c $\frac{1}{4}$ of 12 triangles



$$\boxed{12} \div \boxed{4} = \boxed{3}$$

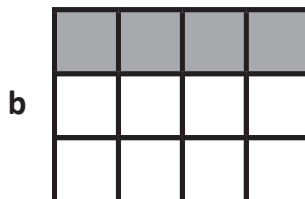
$$\frac{1}{4} \text{ of } \boxed{12} = \boxed{3}$$

2 Shade $\frac{1}{3}$ of these grids and complete the statements. The first one has been done for you.



$$\boxed{6} \div \boxed{3} = \boxed{2}$$

$$\frac{1}{3} \text{ of } \boxed{6} = \boxed{2}$$



$$\boxed{12} \div \boxed{3} = \boxed{4}$$

$$\frac{1}{3} \text{ of } \boxed{12} = \boxed{4}$$

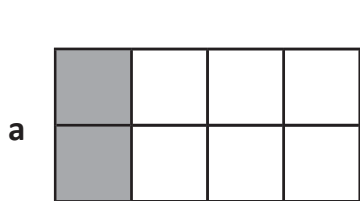


$$\boxed{9} \div \boxed{3} = \boxed{3}$$

$$\frac{1}{3} \text{ of } \boxed{9} = \boxed{3}$$

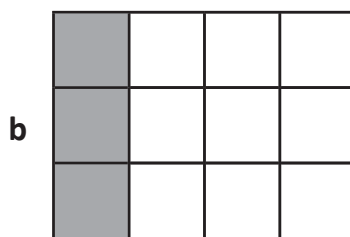
Working with fractions – fractions of a collection

3 Shade $\frac{1}{4}$ on these grids and complete the statements:



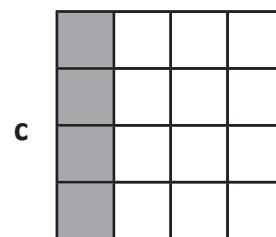
$$\boxed{8} \div \boxed{4} = \boxed{2}$$

$$\frac{1}{4} \text{ of } \boxed{8} = \boxed{2}$$



$$\boxed{12} \div \boxed{4} = \boxed{3}$$

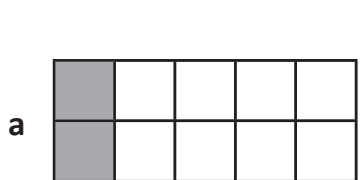
$$\frac{1}{4} \text{ of } \boxed{12} = \boxed{3}$$



$$\boxed{16} \div \boxed{4} = \boxed{4}$$

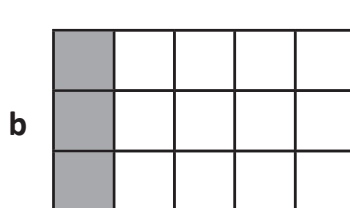
$$\frac{1}{4} \text{ of } \boxed{16} = \boxed{4}$$

4 Shade $\frac{1}{5}$ on these grids and complete the statements:



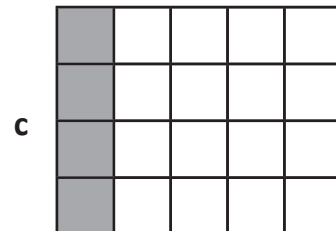
$$\boxed{10} \div \boxed{5} = \boxed{2}$$

$$\frac{1}{5} \text{ of } \boxed{10} = \boxed{2}$$



$$\boxed{15} \div \boxed{5} = \boxed{3}$$

$$\frac{1}{5} \text{ of } \boxed{15} = \boxed{3}$$



$$\boxed{20} \div \boxed{5} = \boxed{4}$$

$$\frac{1}{5} \text{ of } \boxed{20} = \boxed{4}$$

5 Find the fractions of these numbers:

a $\frac{1}{2}$ of 8 = $\boxed{4}$

b $\frac{1}{4}$ of 12 = $\boxed{3}$

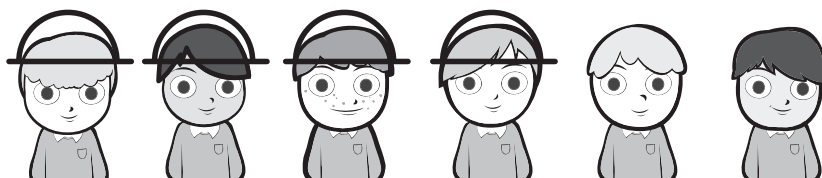
c $\frac{1}{3}$ of 9 = $\boxed{3}$

d $\frac{1}{5}$ of 15 = $\boxed{3}$

e $\frac{1}{8}$ of 16 = $\boxed{2}$

f $\frac{1}{4}$ of 20 = $\boxed{5}$

6 Complete this picture to show that $\frac{2}{3}$ of these boys are wearing hats:



First work out what $\frac{1}{3}$ of 6 is then times by 2.



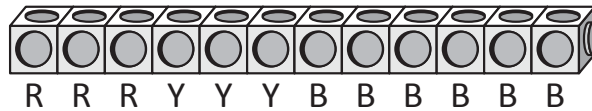
THINK

Working with fractions – fractions of a collection

Josie connected 12 cubes. $\frac{1}{4}$ were red, $\frac{1}{4}$ were yellow and the rest were blue. What fraction of the whole were blue?

$$\frac{6}{12} \text{ or } \frac{1}{2}$$

Red: $\frac{1}{4}$ of 12 = 3 Yellow: $\frac{1}{4}$ of 12 = 3 Blue = 6



7 Answer these cube problems:

a Amy connected 8 cubes. $\frac{1}{2}$ were green, $\frac{1}{4}$ were red and the rest were blue.



How many were blue? Green: $\frac{1}{2}$ of 8 = Red: $\frac{1}{4}$ of 8 =

b Joel connected 16 cubes. $\frac{1}{2}$ were blue, $\frac{1}{4}$ were orange and the rest were purple.



How many were purple? Blue: $\frac{1}{2}$ of 16 = Orange: $\frac{1}{4}$ of 16 =

c Natalie connected 20 cubes. $\frac{1}{4}$ were yellow, $\frac{1}{5}$ were green and the rest were orange.



How many were orange? Yellow: $\frac{1}{4}$ of 20 = Green: $\frac{1}{5}$ of 20 =

8 Amber scattered a packet of 24 beads on her desk to see how many blue ones there were. Below is a list of what was in the packet. Shade them as shown:

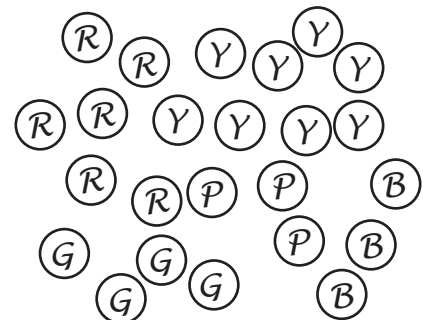
a $\frac{1}{4}$ were red =

b $\frac{1}{8}$ were pink =

c $\frac{1}{3}$ were yellow =

d $\frac{1}{6}$ were green =

e The rest were blue. How many were blue?



Working with fractions – fraction word problems

- 1 Jess spent half of her pocket money on a magazine. If she gets \$10 pocket money, how much was the magazine?

$$\frac{1}{2} \text{ of } \$10 = \$5 \text{ or } \$10 \div 2 = \$5$$

\$5

- 2 If one quarter of a book of stickers is 8 stickers, how many stickers are there in the whole book?

$$8 \times 4 = 32$$

32 sweets

- 3 Marley and Matt shared a vegetarian pizza that had been cut into 8 pieces. Marley ate $\frac{1}{4}$ and Matt ate $\frac{1}{2}$. How many pieces were left?

$$\text{Marley ate } \frac{1}{4} \text{ of } 8 = 2 \text{ pieces}$$

$$\text{Matt ate } \frac{1}{2} \text{ of } 8 = 4 \text{ pieces}$$

$$8 - 6 = 2$$

2 pieces left

- 4 Amy had 24 flower pots. She painted $\frac{1}{8}$ of them pink and $\frac{1}{4}$ of them blue, and left the rest plain. How many plain flower pots were there?

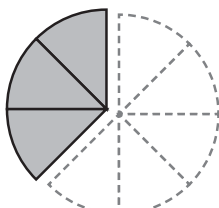
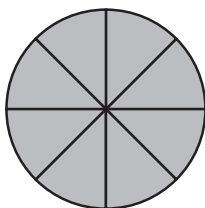
$$\frac{1}{8} \text{ of } 24 = 3 \text{ pink flower pots}$$

$$\frac{1}{4} \text{ of } 24 = 6 \text{ blue flower pots}$$

$$24 - 9 = 15$$

15 plain flower pots

- 5 Josie cut two vegetable pies into eighths. If he ate $\frac{5}{8}$ of a pie, how much was left?



So $1\frac{3}{8}$ is left.

$1\frac{3}{8}$ pies



Getting ready

This is a game for either 3 or 5 players. Each player will need to cut out a copy of the cards on page 11.



What to do

Choose one person to be the dealer. Each player cuts out the cards and gives them to the dealer. The object of this game is to collect as many pairs of cards showing the same fraction as possible.

The dealer shuffles the cards well and deals 6 cards to each player. The remaining cards are placed face down in 'the pond' in the middle with players sitting around the pond in a circle.

- 1 The player on the dealer's right begins by asking any player for a specific card. For example: "Amity do you have a card that shows $\frac{1}{4}$?"
- 2 If Amity has a $\frac{1}{4}$ card she must hand over that card and the same player asks anyone in the group for another card.
- 3 If a player does not have the card that was asked for they must say, "Go fish." Then the person asking must take a card from 'the pond' and it is the next person's turn.
- 4 Play continues until there are no more cards left in the pond. The player with the most sets is the winner.

Observe students.



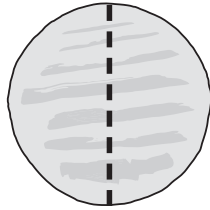


		$\frac{1}{2}$
		$\frac{1}{4}$
		$\frac{3}{4}$
		$\frac{1}{3}$

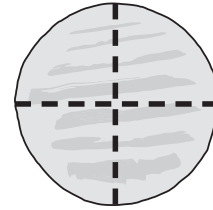
Types of fractions – equivalent fractions

Different fractions can have the same amount. They are equivalent.

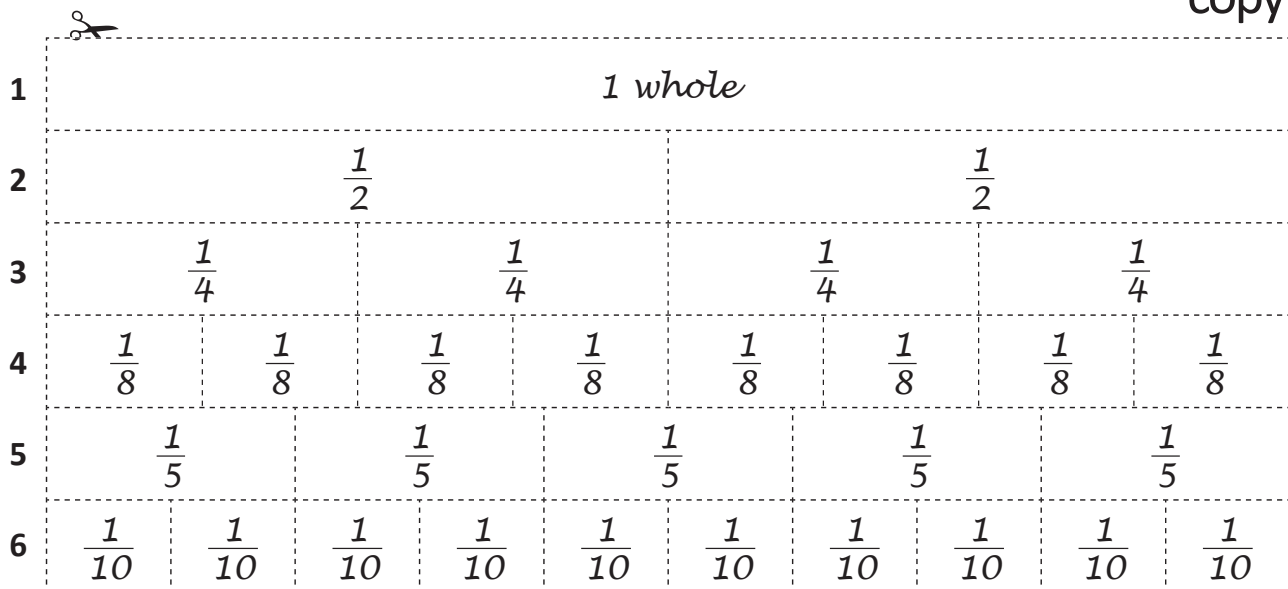
This piece of pita bread has been cut into 2 parts.
 $\frac{1}{2}$ has been eaten.



This piece of pita bread has been cut into 4 parts.
 $\frac{2}{4}$ has been eaten.



Here we are going to explore equivalency. You will need a copy of these fraction strips.



First colour in each strip a different colour, then follow these steps:

Strip 1: Cut out the first strip and write '1 whole'.

Strip 2: Cut out the second strip, fold it in half and cut the 2 equal size pieces. Label each piece $\frac{1}{2}$.

Strip 3: Cut it out, fold it in half and half again. Cut the 4 pieces and label each piece $\frac{1}{4}$.

Strip 4: Cut out the next strip and fold into eighths. How will you do this? Cut the 8 pieces and label each piece $\frac{1}{8}$.

Strips 5 and 6: The last 2 strips have been marked for you.

Count the markings. What fractions are they?

1	1
5	10

Place all of these strips into a plastic sleeve to keep them all in one place. This is your fraction kit.

Types of fractions – equivalent fractions

1 Use the equivalent fraction strips to answer these:

a How many quarters in one half? $\frac{2}{4}$

b How many eighths in one half? $\frac{4}{8}$

c How many fifths in one whole? $\frac{5}{5}$

d How many tenths in one half? $\frac{5}{10}$

Use the equivalent fraction strips to play these games. Both games are for 2 players only.

You will need: ■ your fraction kit ■ a die



Number on die	Fraction piece from kit
1 or 2	$\frac{1}{2}$ red
3 or 4	$\frac{1}{4}$ yellow
5 or 6	$\frac{1}{8}$ orange

Observe students.

Game 1

The aim of this game is to be the first to reveal the whole piece of paper from your fraction kit.

Start the game with the whole covered with 2 halves.

Player 1 rolls the die and takes off that fraction. Players may need to swap pieces from their own kit first. For example, if you roll $\frac{1}{4}$ first, you need to swap $\frac{1}{2}$ for $\frac{2}{4}$, then you can take off $\frac{1}{4}$.

Player 2 rolls the die and takes off that fraction, swapping pieces if needed.

The winner is the player who is the first to reveal the whole piece of paper first.

Game 2

The aim of this game is to be the first player to complete 2 wholes.

2 players use both sets of fraction strips. Line up the 2 wholes together.

Player 1 rolls the die and places the fraction piece on top of one of the wholes.

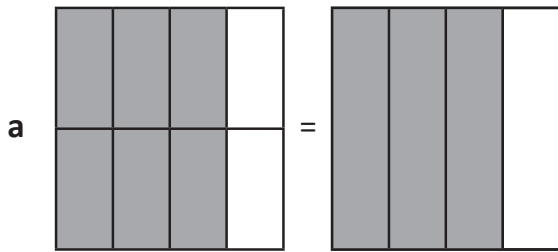
Player 2 rolls the die and places that fraction piece on top of one of the wholes. Players take turns.

The winner is first player who is the first to place the last piece that covers 2 wholes.

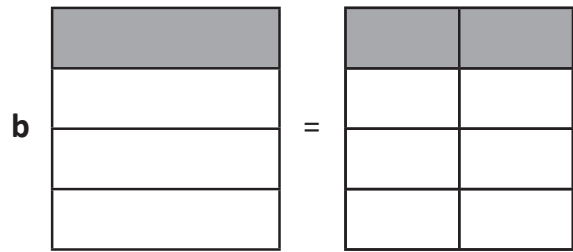
You cannot go over 2 wholes. Your last piece must fit exactly.

Types of fractions – equivalent fractions

2 Shade and label these models to show equivalent fractions:

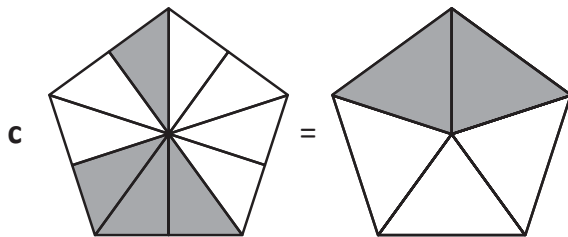


$$\frac{6}{8} = \frac{3}{4}$$

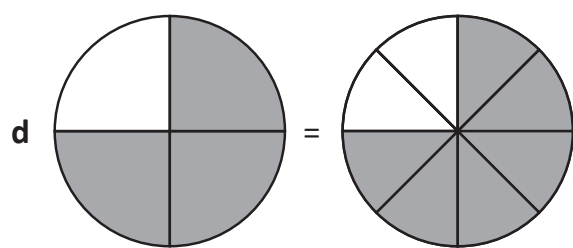


$$\frac{1}{4} = \frac{2}{8}$$

Answers will vary.



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



$$\frac{3}{4} = \frac{6}{8}$$

3 Write either T for true or F for false under each statement:

a $\frac{2}{8} > \frac{1}{10}$

T

b $\frac{3}{10} < \frac{1}{4}$

F

c $\frac{3}{5} < \frac{3}{10}$

F

d $\frac{4}{5} > \frac{7}{10}$

T

e $\frac{4}{8} < \frac{3}{4}$

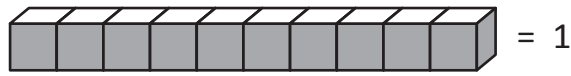
T

f $\frac{5}{10} < \frac{1}{5}$

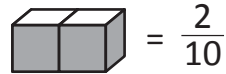
F

Types of fractions – mixed numerals

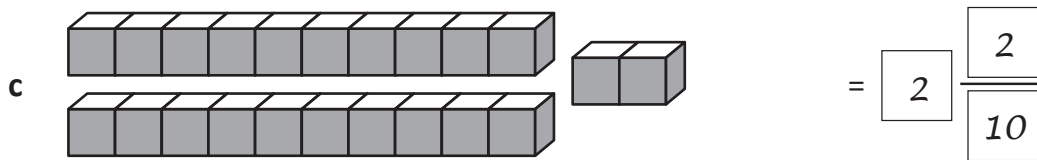
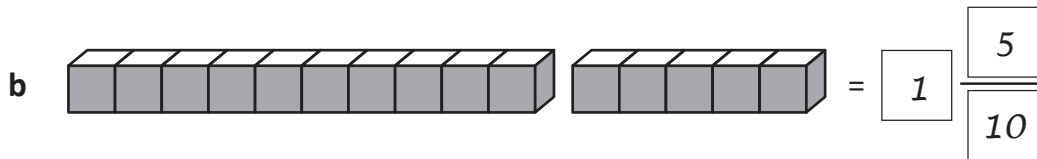
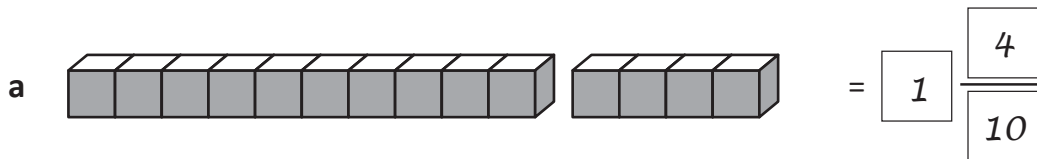
A mixed numeral is a whole number and a fraction. For example, say we connected 10 multilink cubes and named this as 1 whole.



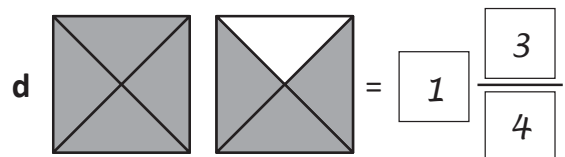
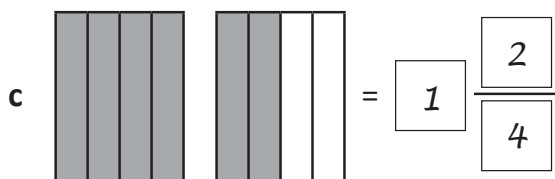
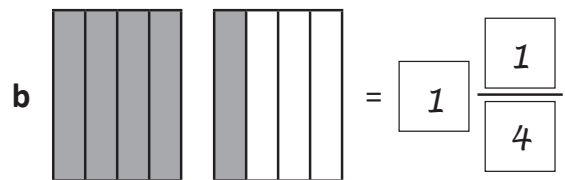
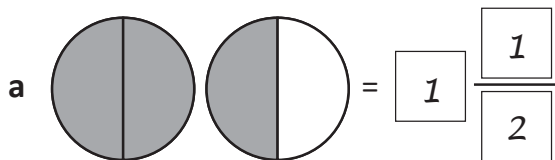
If we then picked up 2 more multilink cubes we have another 2 tenths.



- 1 In each of these problems, 10 multilink cubes represent 1 whole. Write the mixed numeral for each set of multilink cubes.

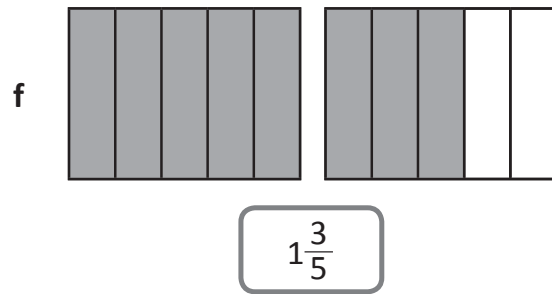
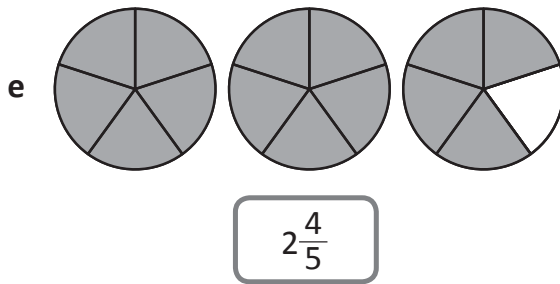
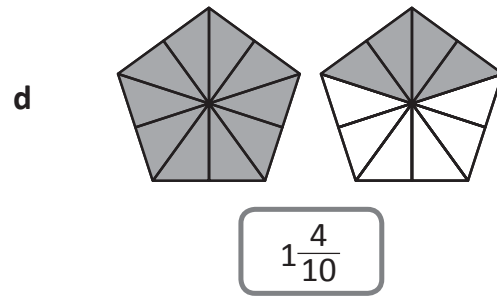
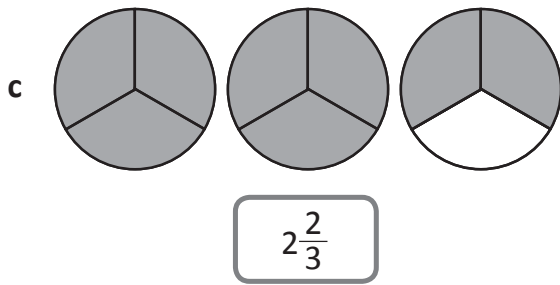
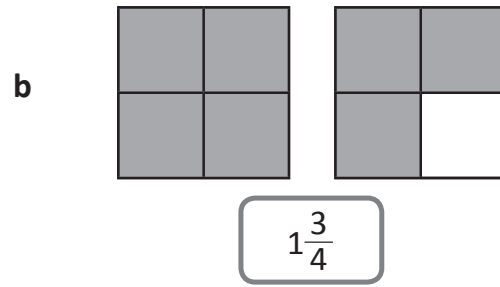
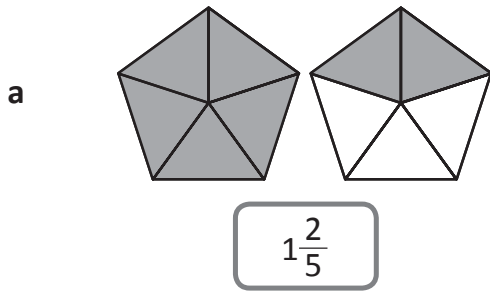


- 2 Write the mixed numerals that these fraction models are showing:

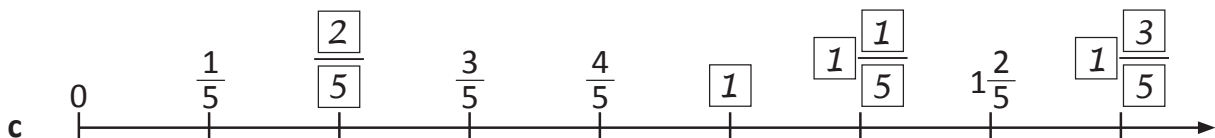
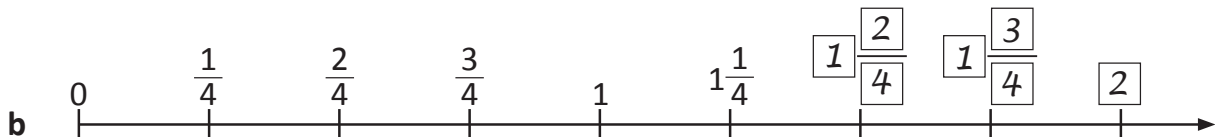
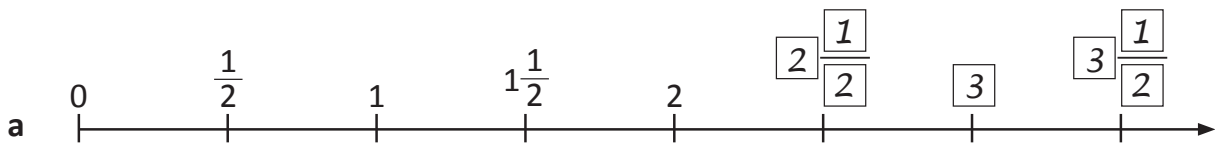


Types of fractions – mixed numerals

3 Shade these fraction models to show the mixed numerals: *Answers will vary.*

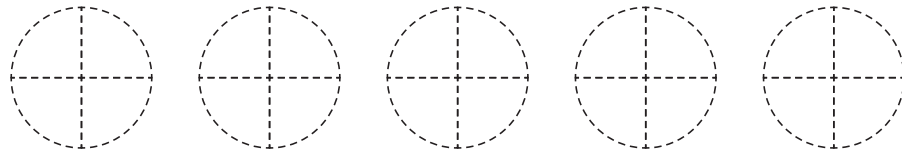


4 Complete these number lines:



Types of fractions – mixed numerals activity

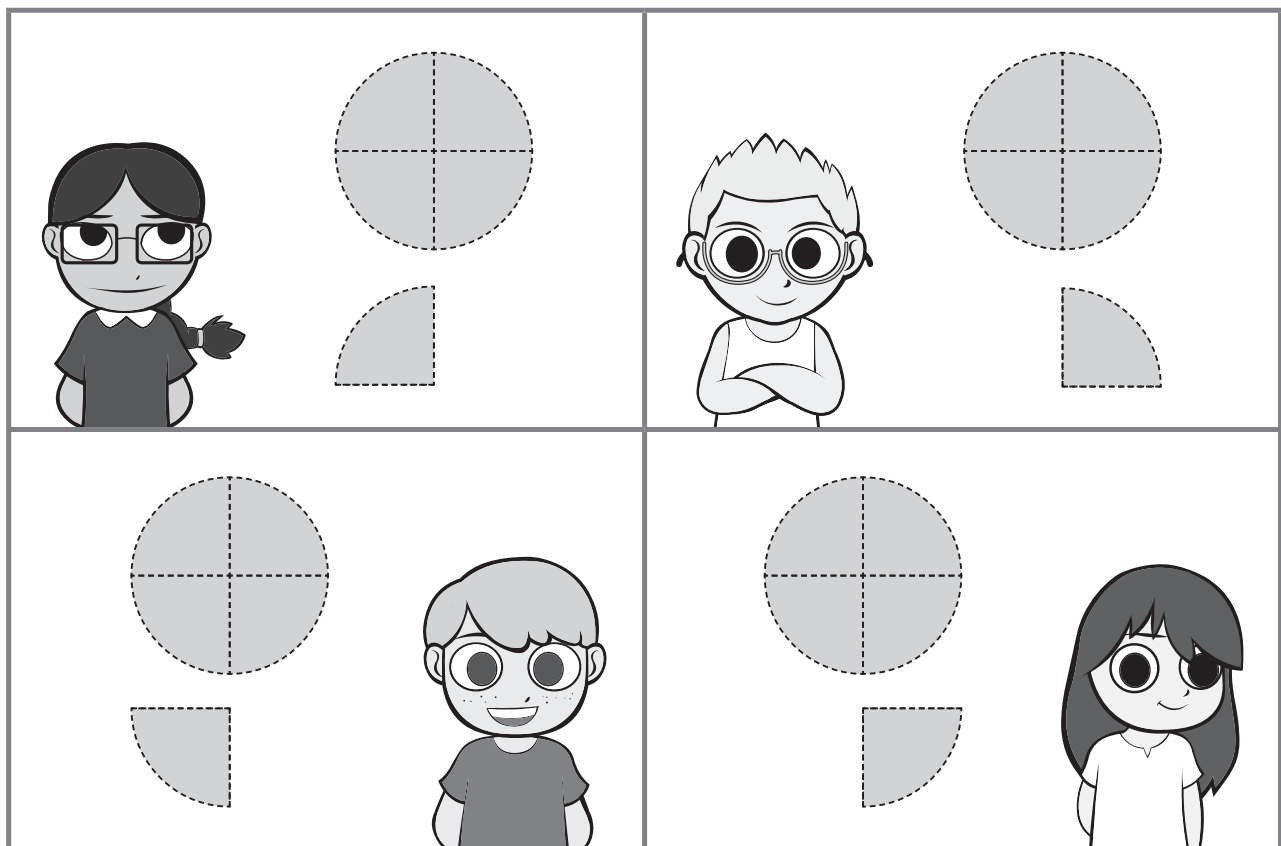
For these problems, you will need a copy of page 20. Cut out the shapes for the following 3 problems and figure out the answers. Once you are happy with your solutions, paste the pieces next to each person and write your answer as a mixed numeral at the bottom of each page.



Problem 1: A group of friends are working together on an art project. They need to share 5 red paper circles between 4 of them. Show them how to do this.

Hint: Cut each circle into quarters.

This means there are now a total of 20 pieces to share among 4 members.
Share these pieces evenly among 4 members:

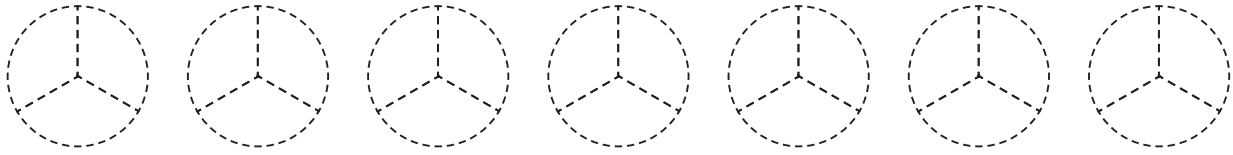


What is each person's share of red paper circles?

$$1 \frac{1}{4}$$

Types of fractions – mixed numerals activity

Problem 2: This group needs to share 7 blue paper circles. Show them how.



Hint: Cut each circle into 3 pieces.

This means there are now a total of 21 pieces to share among 3 members.

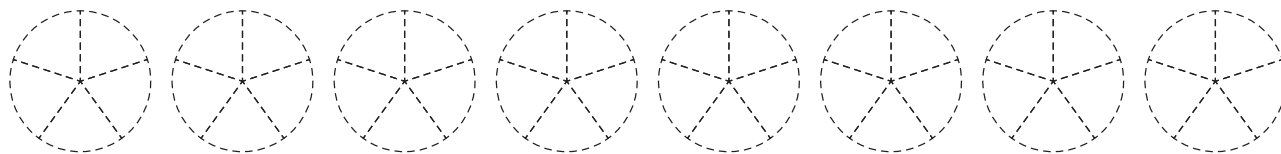
Share these pieces evenly among 3 members:

What is each person's share of blue paper circles?

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

Types of fractions – mixed numerals activity

Problem 3: This group needs to share 8 purple paper circles. Show them how.



Hint: Cut each circle into 5 pieces.

This means there are now a total of 40 pieces to share among 5 members.

Share these pieces evenly among 5 members:

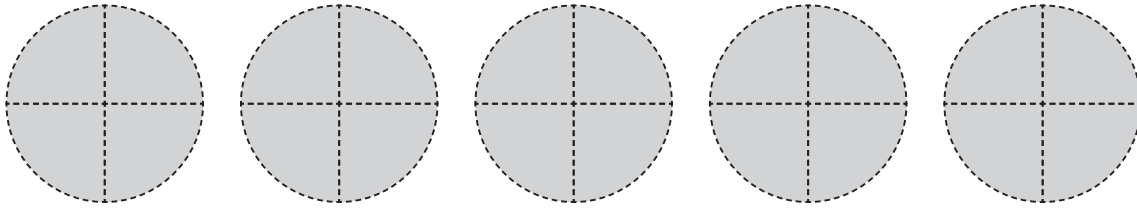
	<p>What is each person's share of purple paper circles?</p> $1 \frac{3}{5}$

Types of fractions – mixed numerals activity

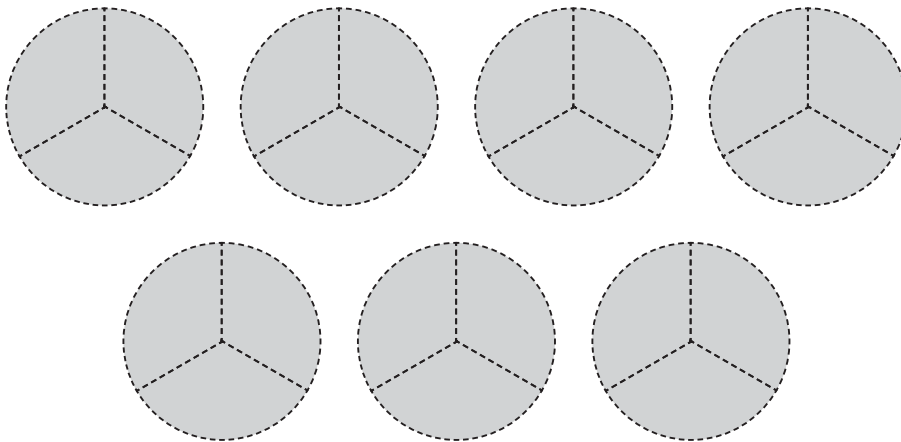
Copy and cut out the following shapes:



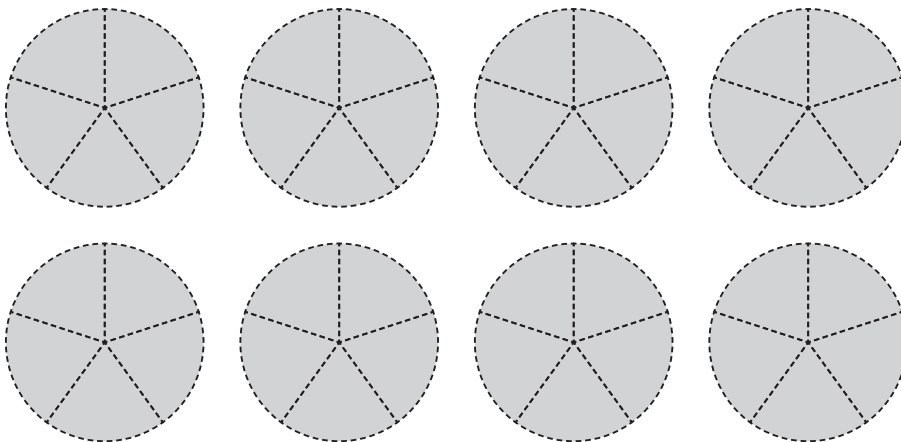
Problem 1



Problem 2



Problem 3





Getting ready

This is a game for 2 to 4 players. You will need the playing board below, 3 dice and each player will need a different set of coloured counters.



What to do

The aim of this game is to claim 4 squares in a row by covering the mixed numbers with your counters. You can go horizontally, vertically or diagonally.

Observe students.

Player 1 rolls 3 dice and creates a mixed number with the 3 numbers. For example, if a player rolled a 3, 4 and 6, they could put their counter on $3\frac{4}{6}$ or $6\frac{3}{4}$ or $4\frac{3}{6}$.

If a player cannot make a fraction to claim or it is already claimed, they miss a turn.

Note: Make sure the numerator is smaller than the denominator.

$3\frac{3}{5}$	$1\frac{1}{5}$	$6\frac{1}{3}$	$5\frac{1}{3}$	$1\frac{1}{2}$	$3\frac{4}{5}$	$4\frac{1}{4}$	$5\frac{2}{3}$
$3\frac{1}{3}$	$3\frac{2}{3}$	$5\frac{1}{3}$	$2\frac{2}{4}$	$4\frac{2}{5}$	$1\frac{3}{4}$	$2\frac{3}{6}$	$6\frac{2}{5}$
$4\frac{3}{4}$	$1\frac{4}{6}$	$3\frac{4}{5}$	$1\frac{1}{4}$	$5\frac{1}{5}$	$2\frac{1}{6}$	$5\frac{2}{6}$	$4\frac{2}{6}$
$3\frac{3}{4}$	$2\frac{2}{3}$	$4\frac{4}{4}$	$6\frac{1}{6}$	$1\frac{1}{3}$	$4\frac{1}{5}$	$3\frac{3}{6}$	$1\frac{2}{3}$
$2\frac{1}{2}$	$2\frac{3}{4}$	$4\frac{4}{6}$	$6\frac{5}{6}$	$1\frac{5}{6}$	$3\frac{1}{6}$	$5\frac{2}{5}$	$1\frac{1}{6}$
$2\frac{1}{3}$	$6\frac{4}{6}$	$4\frac{4}{5}$	$6\frac{3}{6}$	$2\frac{2}{5}$	$5\frac{4}{5}$	$6\frac{3}{6}$	$1\frac{2}{4}$
$4\frac{3}{6}$	$2\frac{3}{4}$	$5\frac{4}{6}$	$6\frac{2}{6}$	$1\frac{1}{5}$	$3\frac{5}{6}$	$6\frac{3}{4}$	$5\frac{5}{6}$



Getting ready

This is a game for 2 players. You will need a copy of the playing cards on this page and page 23. Cut them out and shuffle them well. Players take turns being the dealer.



copy



What to do

The aim of this game is to get rid of all the cards. The dealer deals out all the cards evenly so each player has the same amount of cards.

Each player keeps their cards in a pile face down.

On the count of 3, players turn over the top card and place them on the table.

The player who has the greater fraction wins the round and the other player adds both cards to their pile. If the fractions are equivalent, play continues until a player wins the round.

The winner is the first player to get rid of all their cards.

Observe students.

$\frac{1}{3}$	$\frac{2}{3}$	$\frac{1}{10}$	$\frac{2}{10}$
$\frac{1}{5}$	$\frac{2}{5}$	$\frac{3}{5}$	$\frac{4}{5}$
$\frac{1}{4}$	$\frac{2}{4}$	$\frac{3}{4}$	$\frac{3}{10}$



$$\frac{4}{10}$$

$$\frac{5}{10}$$

$$\frac{6}{10}$$

$$\frac{7}{10}$$

$$\frac{8}{10}$$

$$\frac{9}{10}$$

$$\frac{1}{8}$$

$$\frac{2}{8}$$

$$\frac{3}{8}$$

$$\frac{4}{8}$$

$$\frac{5}{8}$$

$$\frac{6}{8}$$

$$\frac{7}{8}$$

$$\frac{1}{2}$$

$$\frac{1}{4}$$

$$\frac{2}{4}$$

$$\frac{3}{4}$$

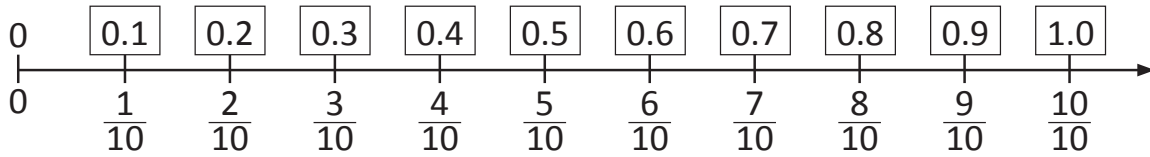
$$\frac{1}{2}$$

$$\frac{4}{8}$$

$$\frac{5}{10}$$

Fractions, decimals and percentages – writing tenths as decimals

Tenths are written as decimals like this:



1 Shade the fraction strips so each one matches the fraction or the decimal:

a 0.7

b $\frac{4}{10}$

c 0.5

2 Order each set of fractions and decimals from smallest to largest:

a $0.8, 0.2, \frac{4}{10}, \frac{9}{10}$

b $\frac{9}{10}, 0.1, 1.0, \frac{5}{10}$

$0.2, \frac{4}{10}, 0.8, \frac{9}{10}$

$0.1, \frac{5}{10}, \frac{9}{10}, 1.0$

3 Show the place value of these decimals by writing them in the table:

		Ones		Tenths
a	0.6	0	•	6
b	2.7	2	•	7
c	5.1	5	•	1



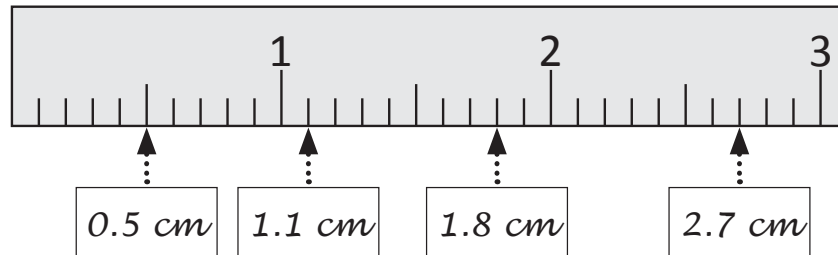
Ones		Tenths
3	•	8

The decimal point signals the place value of numbers smaller than 1.
This number is 3 and $\frac{8}{10}$ or 3 and 0.8.

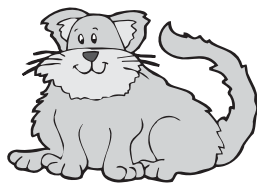
4 Connect the matching fractions and decimals:

Fractions, decimals and percentages – writing tenths as decimals

- 5 Label this section of a ruler as centimetres in decimals. The first box has been done for you. (Note this diagram has been enlarged so you can see the lines clearly.)



- 6 These 3 cats were the finalists in the Fattest Cat Competition. Fill in the blanks below:



Felix – 12.2 kg



Leroy – 11.9 kg



Mosley – 11.5 kg

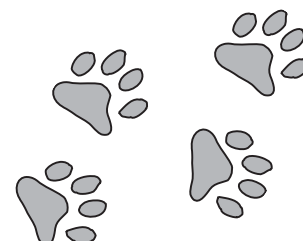
- a Felix is heavier than Leroy by $\frac{3}{10}$ of a kilogram.
- b Leroy is heavier than Mosley by $\frac{4}{10}$ of a kilogram.
- c Mosley is lighter than Felix by $\frac{7}{10}$ of a kilogram.

- 7 Write the mass of each cat and < or > to make the sentence true.

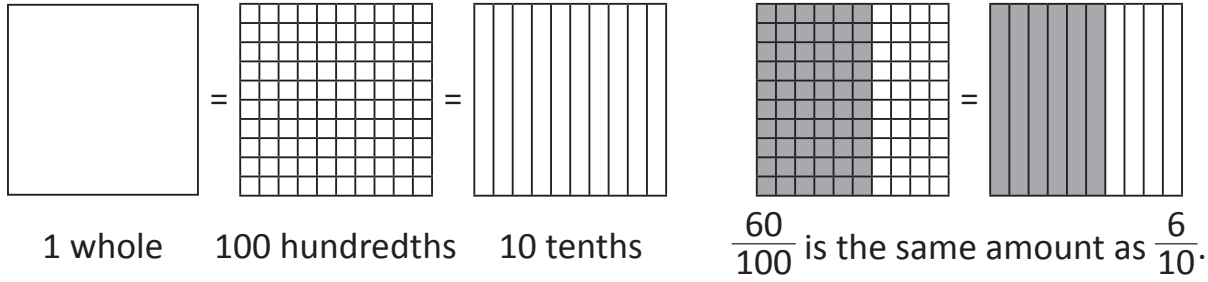
- a Felix Leroy b Mosley Felix
- 12.2 kg > 11.9 kg 11.5 kg < 12.2 kg

- 8 The combined weight of which two cats is 23.7 kg?

Felix and Mosley



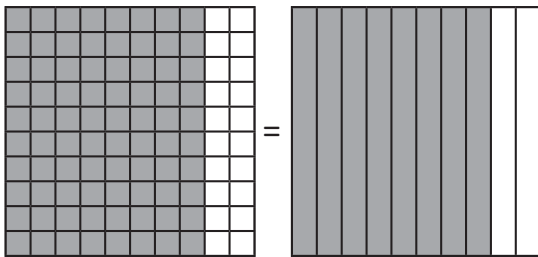
Fractions, decimals and percentages – writing tenths as decimals



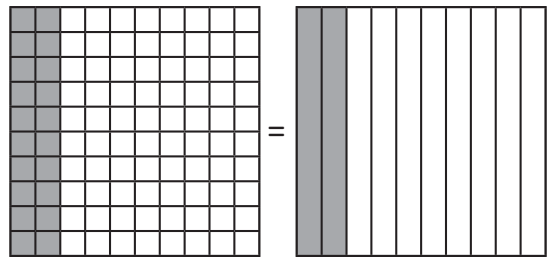
We can divide a whole into one hundred parts. These are called hundredths. Hundredths are made up of 10 lots of tenths.

1 Show how these amounts are the same:

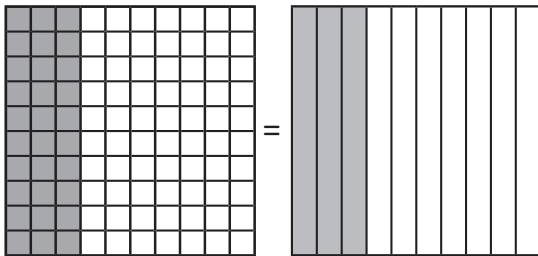
a $\frac{80}{100}$ is the same amount as $\frac{8}{10}$.



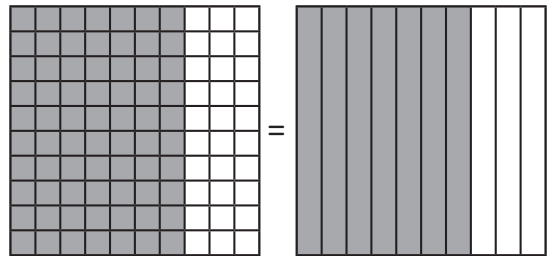
b $\frac{20}{100}$ is the same amount as $\frac{2}{10}$.



c $\frac{30}{100}$ is the same amount as $\frac{3}{10}$.

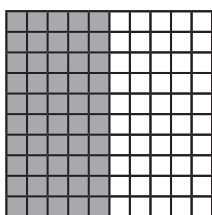


d $\frac{70}{100}$ is the same amount as $\frac{7}{10}$.

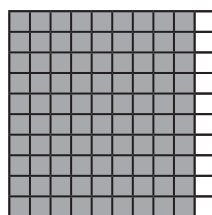


2 Shade these amounts on the hundred grids:

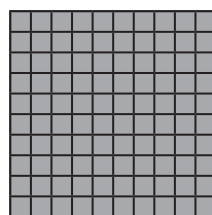
a $\frac{5}{10}$



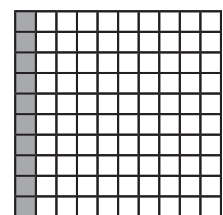
b $\frac{9}{10}$



c $\frac{10}{10}$

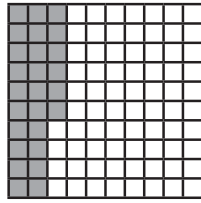


d $\frac{1}{10}$



Fractions, decimals and percentages – relating tenths, hundredths and decimals

This diagram shows 26 hundredths shaded or $\frac{26}{100}$.



Fractions can be written as decimals.
As a decimal, this amount is written as:

Ones	Tenths	Hundredths
0	2	6

3 Complete this table to show the amounts as tenths, hundredths and decimals:

a

Tenths	2	
Hundredths	20	
Decimals	0.2	

b

Tenths	6	
Hundredths	60	
Decimals	0.6	

c

Hundredths	17	
Decimals	0.17	

d

Hundredths	27	
Decimals	0.27	

1.5 is same as 1.50.

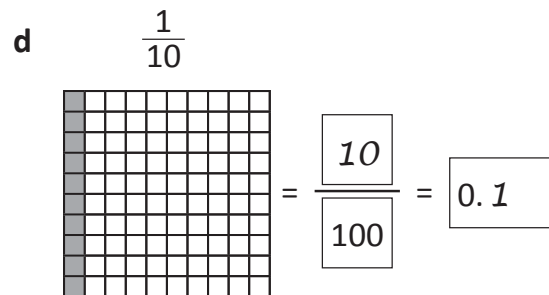
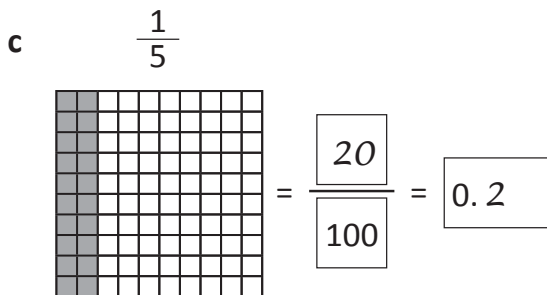
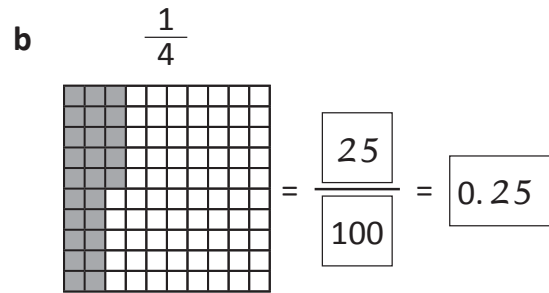
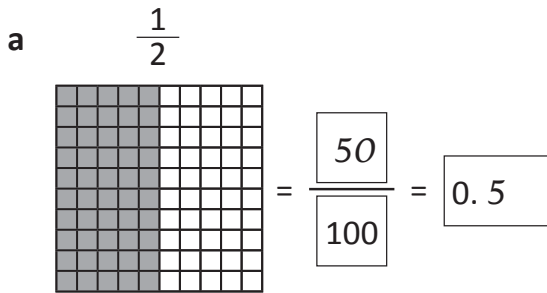


4 Show the place value of these decimals by writing them in the table:

	Hundreds	Tens	Ones		Tenths	Hundredths
a	2.6		2	•	6	
b	3.76		3	•	7	6
c	112.6	1	1	•	6	
d	45.67		4	•	6	7

Fractions, decimals and percentages – relating tenths, hundredths and decimals

5 Shade the fractions on the grid and show them as hundredths and decimals:



6 Express these common fractions as hundredths and as decimals:

a $\frac{1}{2} = \frac{50}{100} = 0.5$

b $\frac{4}{5} = \frac{80}{100} = 0.8$

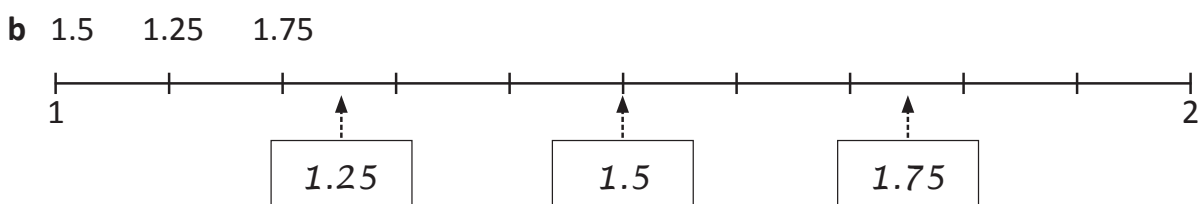
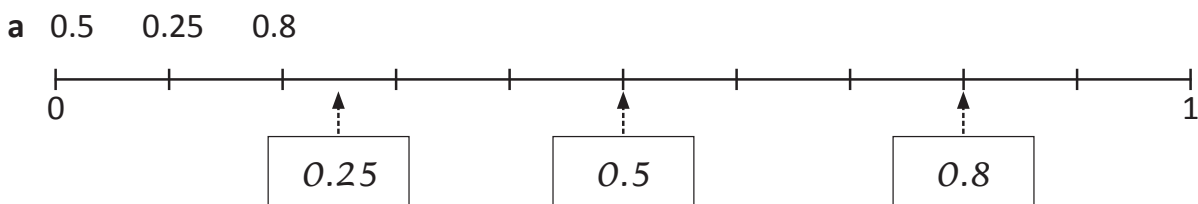
c $\frac{4}{10} = \frac{40}{100} = 0.4$

d $\frac{3}{4} = \frac{75}{100} = 0.75$

e $\frac{2}{4} = \frac{50}{100} = 0.5$

f $\frac{5}{10} = \frac{50}{100} = 0.5$

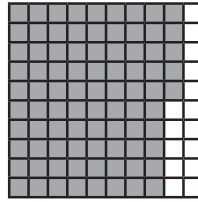
7 Show where the decimals fit on the number lines:



Fractions, decimals and percentages – introducing percentages

A percentage is an amount out of 100.

$$\frac{85}{100} = 85\%$$



1 Colour this hundred square according to the directions:

G	P	B	B	O	O	Y	Y	R	R
G	P	B	B	O	O	Y	Y	R	R
G	P	B	B	O	O	Y		R	R
G	P	B	B	O	O	Y		R	R
G	P	B	B	O	O	Y		R	R
G	P	B		O	O	Y		R	R
G	P	B		O	O	Y		R	R
G	P	B		O	O	Y		R	R
	P	B		O	O	Y		R	R
	P	B		O	O	Y		R	R

- a 8% green
- b 10% pink
- c 15% brown
- d 20% orange
- e 12% yellow
- f 20% red
- g Leave the rest blank.

What percentage is this?

15%

2 The most commonly used percentage amounts are in the table below. Complete the table and shade a hundredth grid for each amount. The first one has been done for you.


	a	b	c	d	e
Percentage	50%	25%	10%	75%	20%
Hundredths	$\frac{50}{100}$	$\frac{25}{100}$	$\frac{10}{100}$	$\frac{75}{100}$	$\frac{20}{100}$
Decimal	0.5	0.25	0.1	0.75	0.2
Fraction	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$	$\frac{3}{4}$	$\frac{2}{10}$ or $\frac{1}{5}$
Hundredth grid					


Fractions, decimals and percentages – introducing percentages

3 Often you can see percentages in shops when it is sale time. Work out the sale price of these items:

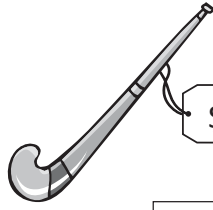


a  \$50
Sale price: \$25

b  \$24
Sale price: \$12

c  \$60
Sale price: \$30

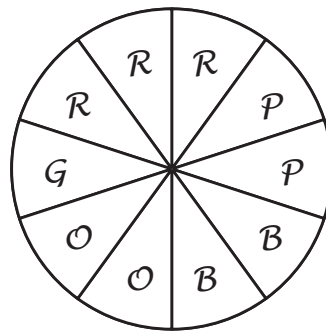
d  \$30
Sale price: \$15

e  \$200
Sale price: \$100

4 Pie charts are used to show information clearly and are often colour coded. Complete the pie charts according to the information. Each whole pie chart is 100% and each segment is 10%. Choose a colour for each bit of information.

a 100 people were surveyed about their favourite weekend activities.

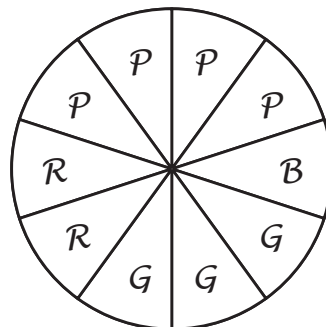
- R Go to a restaurant.... 30%
- G Go to the beach 10%
- O See a movie..... 20%
- B Go shopping..... 20%
- P Play sport 20%



A percentage is an amount out of 100, so $\frac{60}{200}$ would be the same as $\frac{30}{100}$.

b 200 people were surveyed about their favourite sport.

- P Hockey 80
- R Soccer 40
- G Football 60
- B Basketball..... 20





Getting ready

This is a game for 2 players. Each player will need a copy of this page and a copy of the playing cards on page 32.



copy



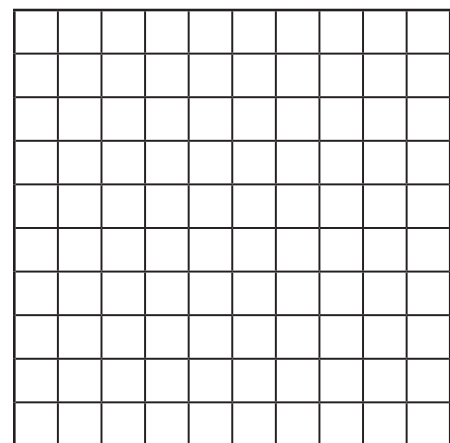
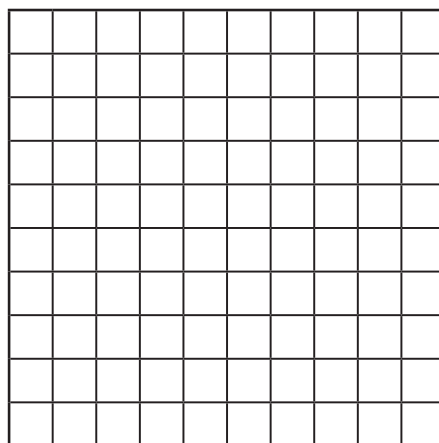
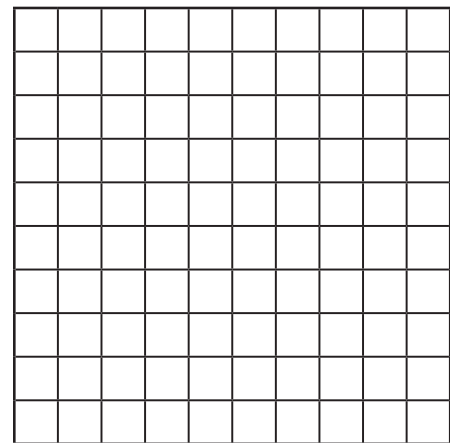
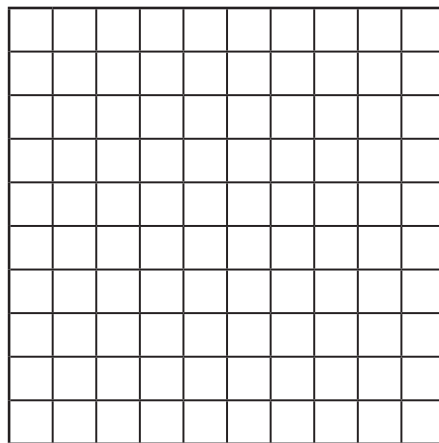
What to do

The object of this game is to be the first player to colour a whole grid. Each player cuts out the playing cards. The 2 players join the cards and shuffle them. There will be 48 cards. Lay 4 cards out in a row, ensuring both players can see them. The rest of the cards go face down in a pile.

Player 1 takes a card from the row of 4 and colours in that amount on one of their hundred grids. Then they put that card at the bottom of the pile and replace it with one from the top of the pile. Player 2 repeats this process.

Players take turns until 1 player has filled in 100 hundredths or 1 whole. (If you go over 100 hundredths or 1 whole, it does not count as a win. You must reach exactly 1 whole.) There are 4 grids so play the best out of 4.

Observe students.





$$\frac{30}{100}$$

20%

$$\frac{50}{200}$$

0.08

0.35

0.17

0.4

$$\frac{10}{200}$$

$$\frac{6}{10}$$

10%

0.19

0.05

0.6

$$\frac{1}{10}$$

$$\frac{15}{100}$$

1%

$$\frac{12}{100}$$

2%

0.15

$$\frac{4}{200}$$

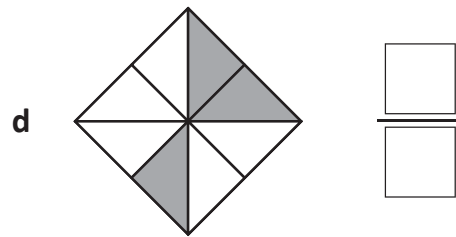
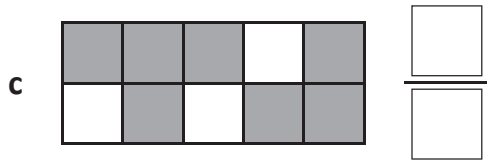
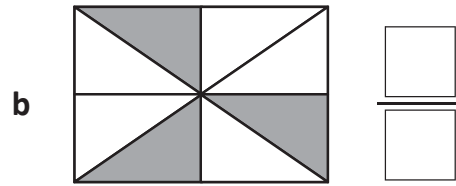
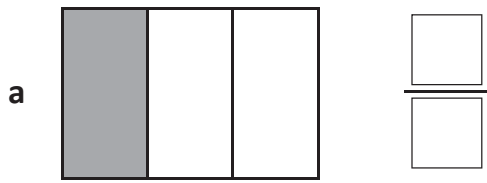
$$\frac{20}{200}$$

0.8

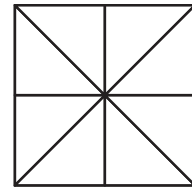
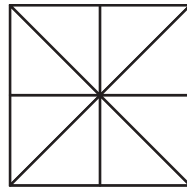
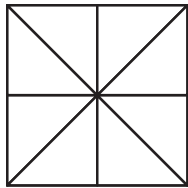
0.2

5%

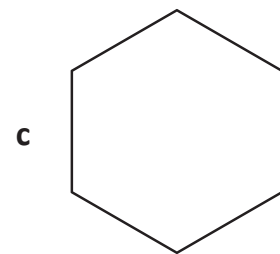
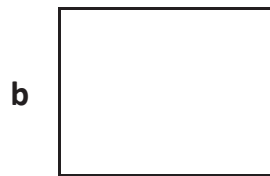
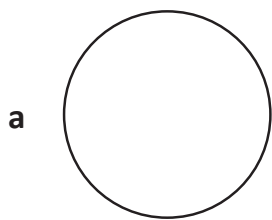
1 Write the fraction shown on each shape:



2 Show $\frac{1}{2}$ in a different way on each shape:

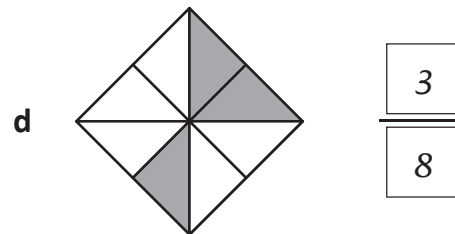
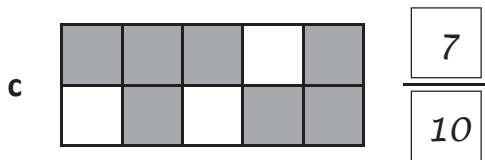
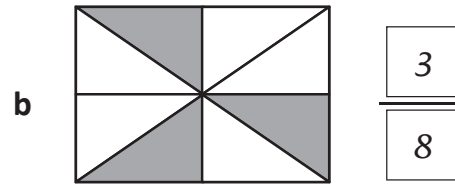
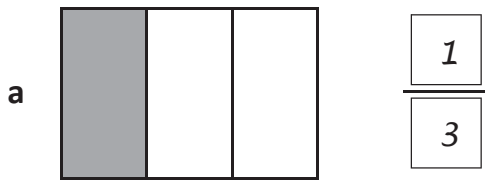


3 Show $\frac{1}{4}$ on each shape:



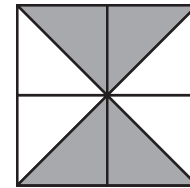
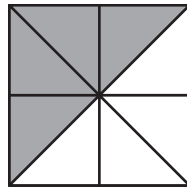
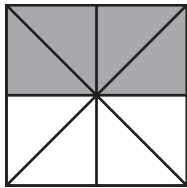
Skills	Not yet	Kind of	Got it
• Interprets the numerator and denominator of a fraction			
• Represents halves and quarters of an object in different ways			
• Interprets the numerator and denominator of a fraction			

1 Write the fraction shown on each shape:



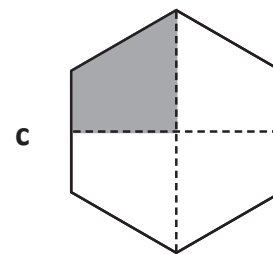
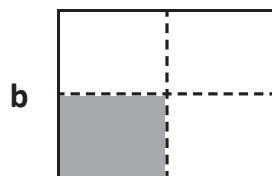
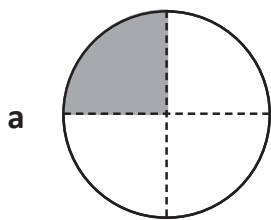
2 Show $\frac{1}{2}$ in a different way on each shape:

Answers will vary.



3 Show $\frac{1}{4}$ on each shape:

Answers will vary.



Skills	Not yet	Kind of	Got it
• Interprets the numerator and denominator of a fraction			
• Represents halves and quarters of an object in different ways			
• Interprets the numerator and denominator of a fraction			

4 Connect the fractions to their places on the number line:

a

$\frac{1}{2}$

$\frac{1}{4}$

$\frac{5}{8}$



b

$\frac{1}{2}$

$\frac{3}{4}$



c

$\frac{3}{8}$

$\frac{5}{8}$

$\frac{1}{4}$

$\frac{1}{2}$

$\frac{3}{4}$



5 Circle the bigger fraction in each pair:

a $\frac{1}{3}$ and $\frac{1}{4}$

b $\frac{1}{5}$ and $\frac{1}{2}$

c $\frac{3}{8}$ and $\frac{1}{4}$

d $\frac{1}{4}$ and $\frac{1}{8}$

e $\frac{1}{4}$ and $\frac{2}{3}$

f $\frac{1}{2}$ and $\frac{4}{10}$

6 Write T for true or F for false next to each pair of fractions:

a $\frac{1}{3} > \frac{1}{4}$

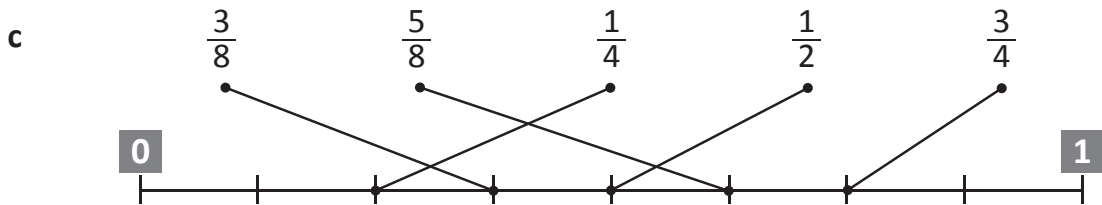
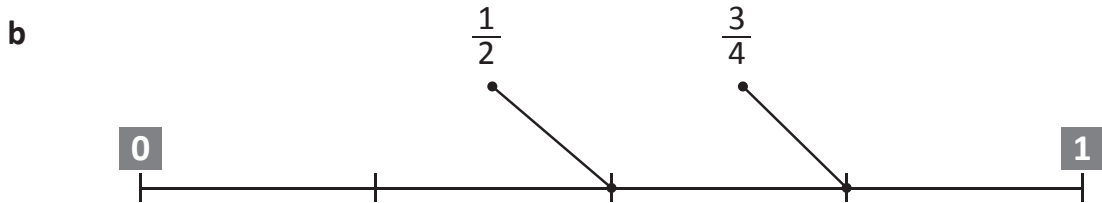
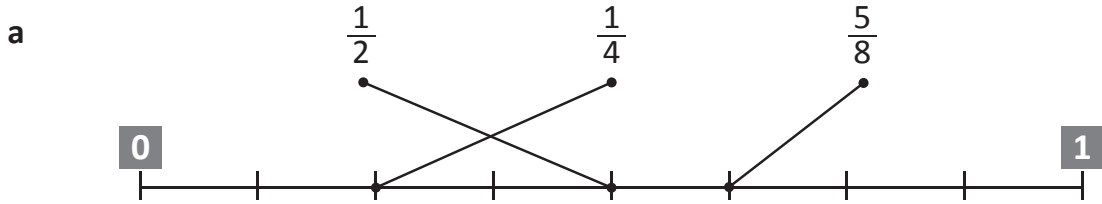
b $\frac{1}{2} = \frac{4}{8}$

c $\frac{2}{3} < \frac{1}{6}$

d $\frac{2}{4} = \frac{3}{6}$

Skills	Not yet	Kind of	Got it
• Orders common fractions with different denominators			
• Finds equivalence between halves, quarters and eighths			

4 Connect the fractions to their places on the number line:



5 Circle the bigger fraction in each pair:

- a $\left(\frac{1}{3}\right)$ and $\frac{1}{4}$ b $\frac{1}{5}$ and $\left(\frac{1}{2}\right)$ c $\left(\frac{3}{8}\right)$ and $\frac{1}{4}$
 d $\left(\frac{1}{4}\right)$ and $\frac{1}{8}$ e $\frac{1}{4}$ and $\left(\frac{2}{3}\right)$ f $\left(\frac{1}{2}\right)$ and $\frac{4}{10}$

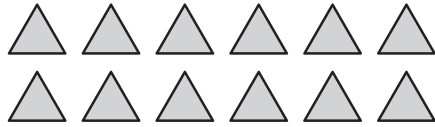
6 Write T for true or F for false next to each pair of fractions:

- a $\frac{1}{3} > \frac{1}{4}$ T b $\frac{1}{2} = \frac{4}{8}$ T c $\frac{2}{3} < \frac{1}{6}$ F d $\frac{2}{4} = \frac{3}{6}$ T

Skills	Not yet	Kind of	Got it
• Orders common fractions with different denominators			
• Finds equivalence between halves, quarters and eighths			

7 Circle the fraction given for each group and complete the statements:

a $\frac{1}{3}$ of 12 triangles



b $\frac{1}{4}$ of 16 stars



8 Find the fraction of these numbers:

a $\frac{1}{4}$ of 12 =

b $\frac{1}{3}$ of 9 =

c $\frac{1}{8}$ of 16 =

d $\frac{1}{5}$ of 15 =

e $\frac{1}{4}$ of 20 =

f $\frac{1}{10}$ of 20 =

9 Solve these fraction word problems.

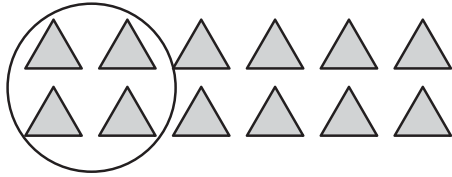
a Josh scattered a bag of 36 buttons onto his desk. $\frac{1}{6}$ of the buttons were black. How many buttons were NOT black?

b Nina and Drew bought a piece of fabric and cut it into 8 pieces. Nina used $\frac{1}{2}$ and Drew used $\frac{3}{8}$. How many pieces were left?

Skills	Not yet	Kind of	Got it
• Finds a fraction of a collection of objects			
• Finds a fraction of a whole number			

7 Circle the fraction given for each group and complete the statements:

a $\frac{1}{3}$ of 12 triangles



b $\frac{1}{4}$ of 16 stars



8 Find the fraction of these numbers:

a $\frac{1}{4}$ of 12 =

b $\frac{1}{3}$ of 9 =

c $\frac{1}{8}$ of 16 =

d $\frac{1}{5}$ of 15 =

e $\frac{1}{4}$ of 20 =

f $\frac{1}{10}$ of 20 =

9 Solve these fraction word problems.

a Josh scattered a bag of 36 buttons onto his desk.
 $\frac{1}{6}$ of the buttons were black. How many buttons were NOT black?

$$\frac{1}{6} \times 36 = 6$$

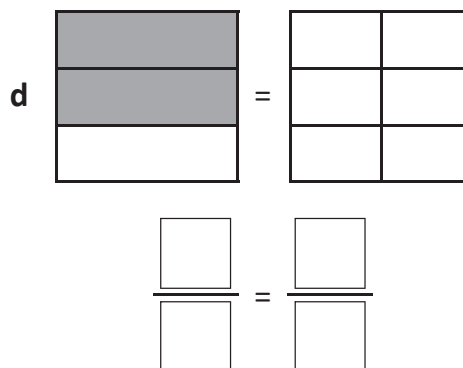
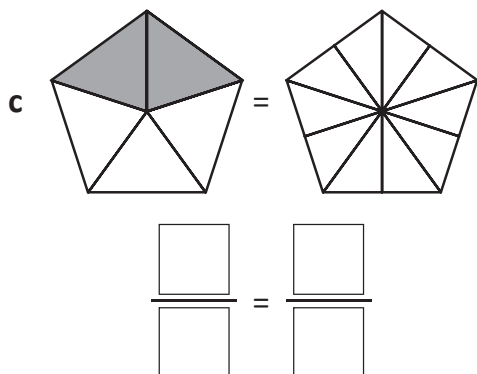
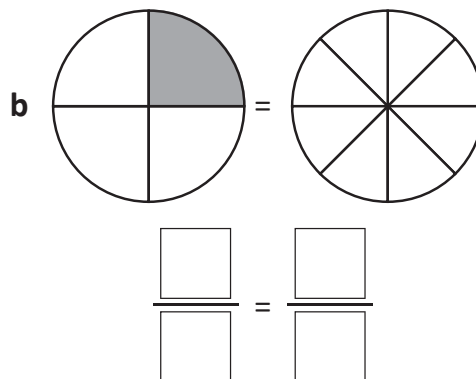
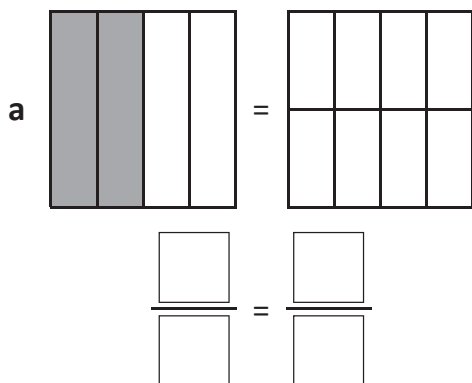
$$36 - 6 = 30$$

b Nina and Drew bought a piece of fabric and cut it into 8 pieces.
 Nina used $\frac{1}{2}$ and Drew used $\frac{3}{8}$. How many pieces were left?

$$\frac{4}{8} + \frac{3}{8} = \frac{7}{8}$$

Skills	Not yet	Kind of	Got it
• Finds a fraction of a collection of objects			
• Finds a fraction of a whole number			

1 Shade and label these models to show equivalent fractions:



2 Make the fractions equivalent:

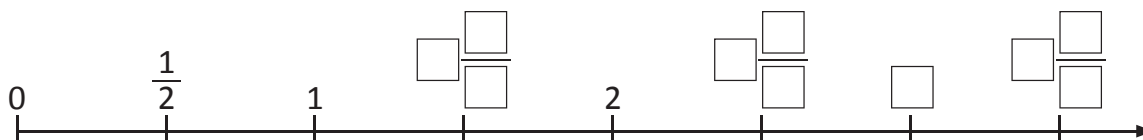
a $\frac{1}{4} = \frac{\square}{8}$

b $\frac{1}{5} = \frac{\square}{10}$

c $\frac{1}{6} = \frac{\square}{12}$

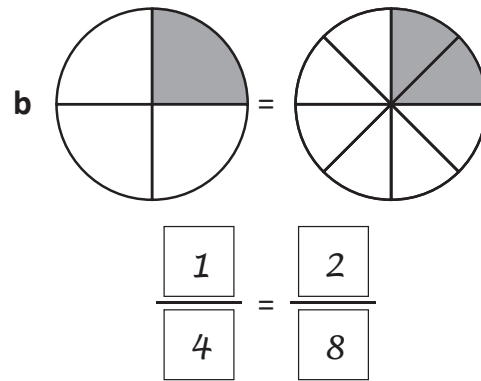
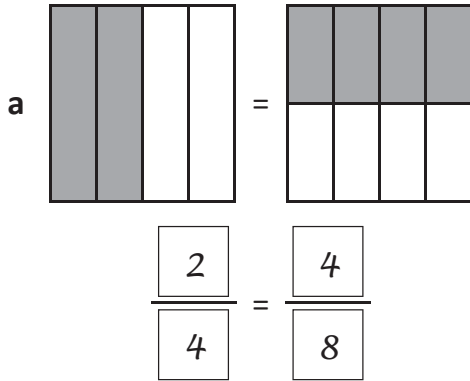
d $\frac{1}{3} = \frac{\square}{6}$

3 Complete this number line:

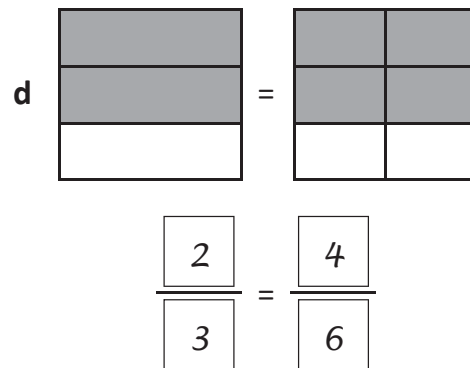
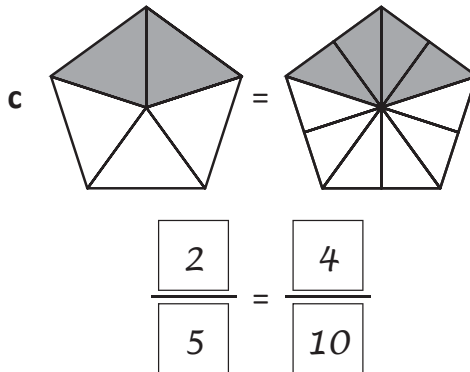


Skills	Not yet	Kind of	Got it
• Finds equivalence between fractions			
• Shows mixed numerals on a number line			

1 Shade and label these models to show equivalent fractions:



Answers will vary.



2 Make the fractions equivalent:

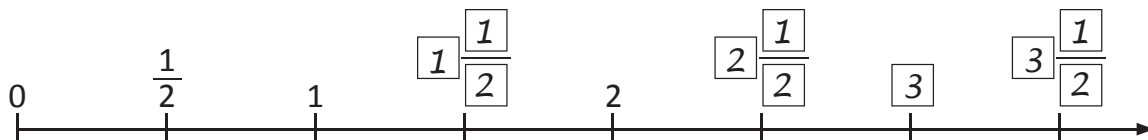
a $\frac{\boxed{1}}{\boxed{4}} = \frac{\boxed{2}}{\boxed{8}}$

b $\frac{\boxed{1}}{\boxed{5}} = \frac{\boxed{2}}{\boxed{10}}$

c $\frac{\boxed{1}}{\boxed{6}} = \frac{\boxed{2}}{\boxed{12}}$

d $\frac{\boxed{1}}{\boxed{3}} = \frac{\boxed{2}}{\boxed{6}}$

3 Complete this number line:



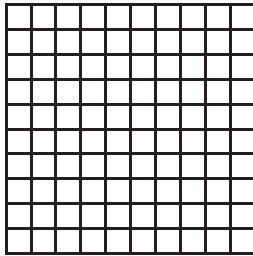
Skills	Not yet	Kind of	Got it
• Finds equivalence between fractions			
• Shows mixed numerals on a number line			

Fractions, decimals and percentages

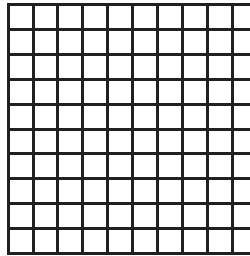
Name _____

1 Shade the number of hundredths on each grid:

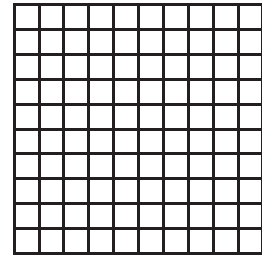
a $\frac{25}{100}$



b $\frac{38}{100}$



c $\frac{78}{100}$



2 Show each grid as hundredths and decimals:

a Hundredths

Decimals

b Hundredths

Decimals

3 Complete each column in this table. The first one has been done for you.

	a	b	c
Percentage	50%	25%	10%
Hundredths	$\frac{50}{100}$		
Decimal	0.5		
Fraction	$\frac{1}{2}$		

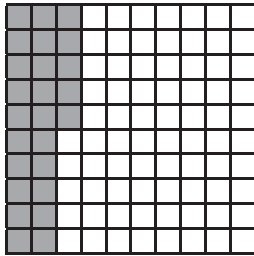
Skills	Not yet	Kind of	Got it
• Uses decimal notation for tenths and hundredths			
• Finds equivalence between tenths, hundredths and decimals			
• Relates common percentages such as 50%, 25% and 10% to a fraction or decimal			

Fractions, decimals and percentages

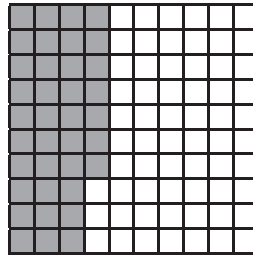
Name _____

1 Shade the number of hundredths on each grid:

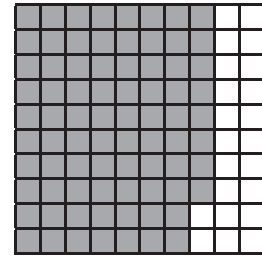
a $\frac{25}{100}$



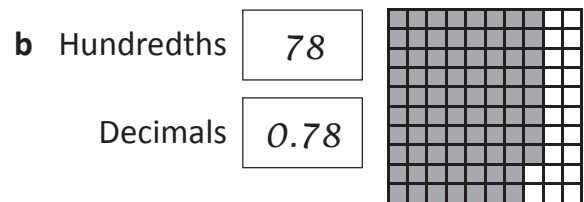
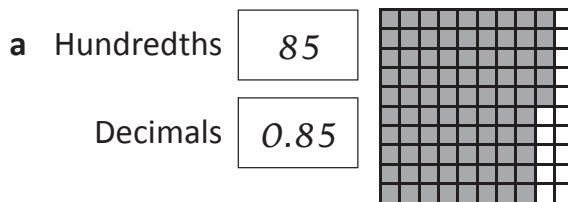
b $\frac{38}{100}$



c $\frac{78}{100}$



2 Show each grid as hundredths and decimals:



3 Complete each column in this table. The first one has been done for you.

	a	b	c
Percentage	50%	25%	10%
Hundredths	$\frac{50}{100}$	$\frac{25}{100}$	$\frac{10}{100}$
Decimal	0.5	0.25	0.1
Fraction	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$

Skills	Not yet	Kind of	Got it
• Uses decimal notation for tenths and hundredths			
• Finds equivalence between tenths, hundredths and decimals			
• Relates common percentages such as 50%, 25% and 10% to a fraction or decimal			