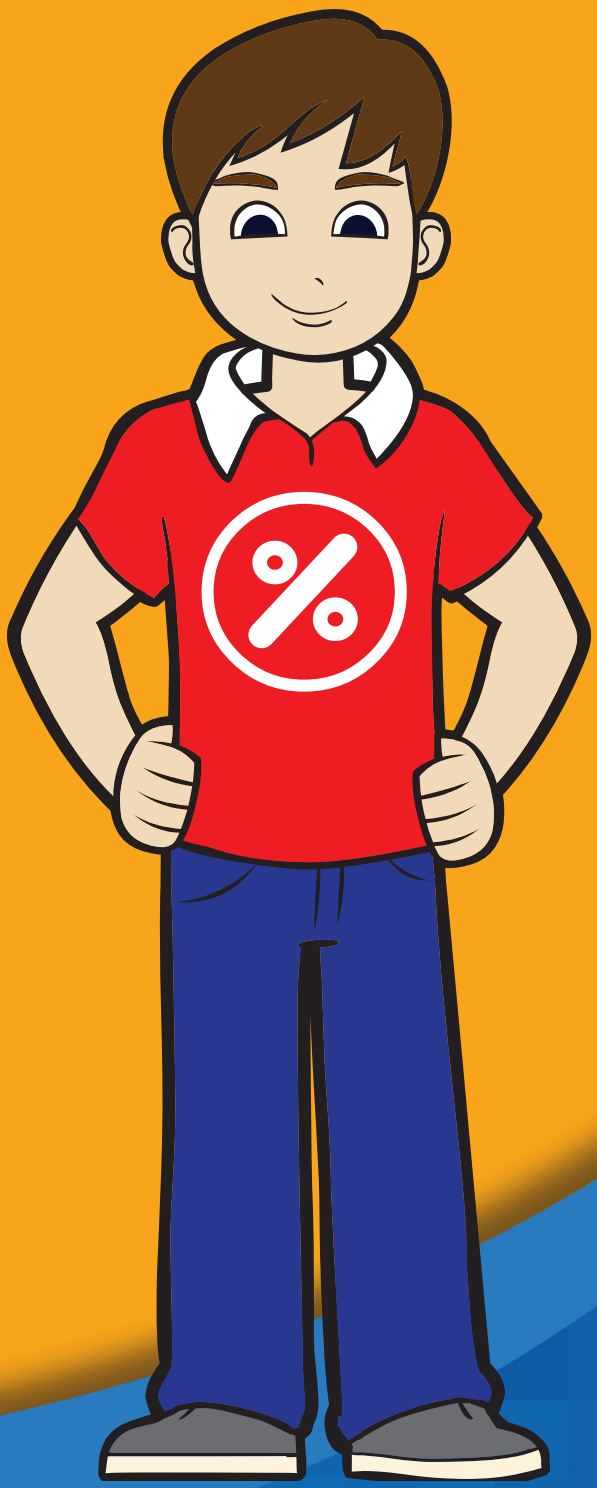
MATHLETICS

F SERIES Teacher Book

Fractions, Decimals and Percentages



Series F – Fractions, Decimals and Percentages

Contents

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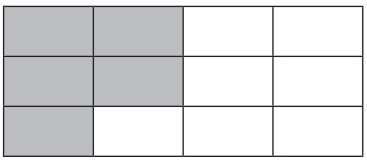
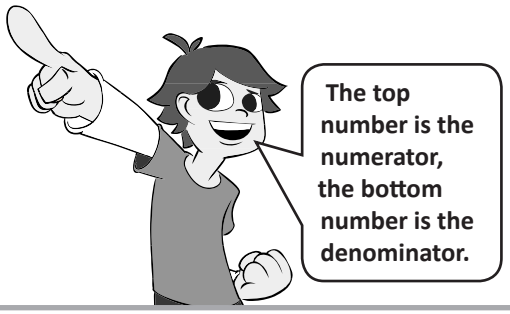
Fractions – fractions of shapes

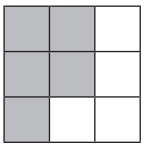
A fraction is a part of a whole.
This shape has 12 equal parts. 5 of these have been shaded.

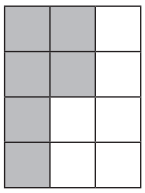


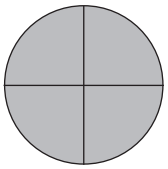
$$\frac{5}{12} = \frac{\text{5 shaded parts}}{\text{12 parts altogether}}$$

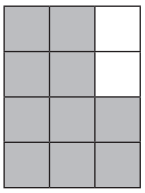


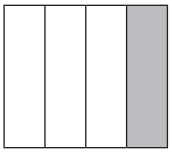
1 **What fraction of each shape has been shaded?**

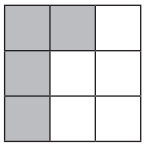
a $\frac{5}{9}$ 

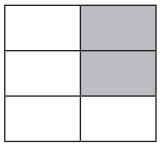
b $\frac{6}{12}$ 

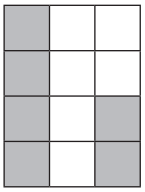
c $\frac{4}{4}$ 

d $\frac{10}{12}$ 

e $\frac{1}{4}$ 

f $\frac{4}{9}$ 

g $\frac{2}{6}$ 

h $\frac{6}{12}$ 

2 **Answer the following questions about the shapes above:**

a What part of **a** is **unshaded**? $\frac{4}{9}$

b What fraction of **e** is **unshaded**? $\frac{3}{4}$

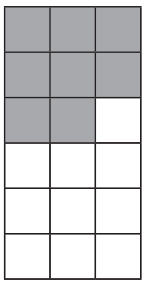
c In **f**, is more of the shape shaded or unshaded? *Unshaded*

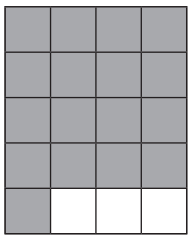
d What fraction of **b** is **unshaded**? $\frac{6}{12}$

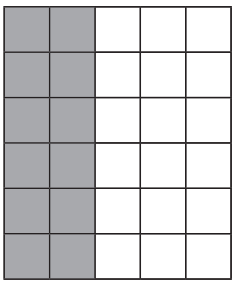
e Look at shape **h**. What can you say about the amount of shaded and unshaded parts?

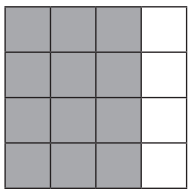
They are equal

3 **Shade the given fraction for each shape:**

a $\frac{8}{18}$ 

b $\frac{17}{20}$ 

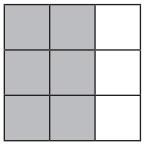
c $\frac{12}{30}$ 

d $\frac{12}{16}$ 

Configuration will vary.

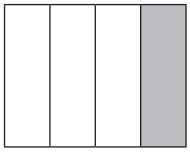
Fractions – fractions of shapes

4 **Are these statements true or false?**

a 

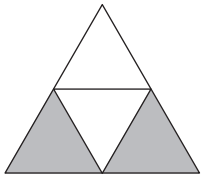
$\frac{6}{9}$ is shaded

True

b 

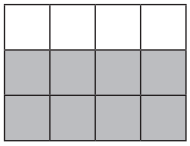
$\frac{1}{4}$ is shaded

True

c 

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

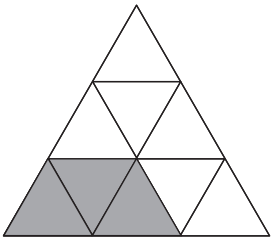
False

d 

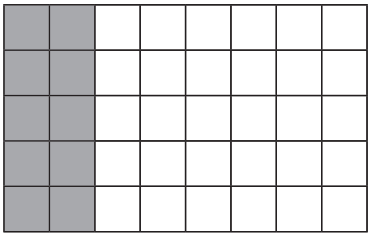
$\frac{7}{12}$ is shaded

False

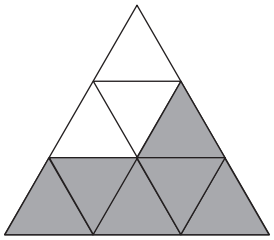
5 **Colour the shapes to show:**

a 

one third

b 

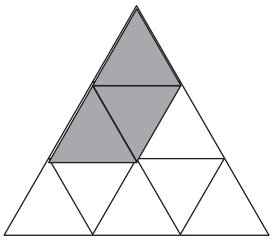
one quarter

c 

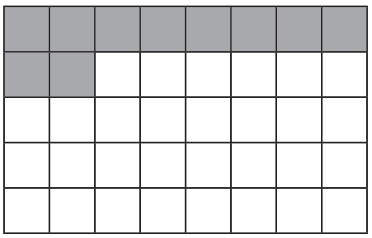
two thirds

Configuration will vary.

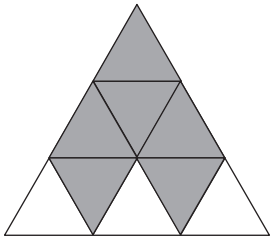
6 **Now find another way to colour the shapes to show the same fraction:**

a 

one third

b 

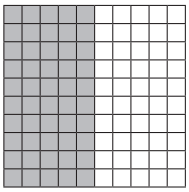
one quarter

c 

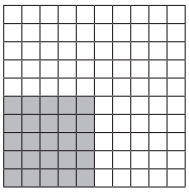
two thirds

Configuration will vary.

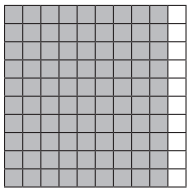
7 **What fraction of each hundred square is shaded?**

a 

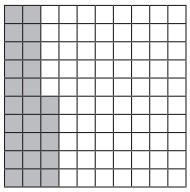
$\frac{50}{100}$ or $\frac{5}{10}$ or $\frac{1}{2}$

b 

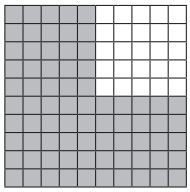
$\frac{25}{100}$ or $\frac{1}{4}$

c 

$\frac{90}{100}$ or $\frac{9}{10}$

d 

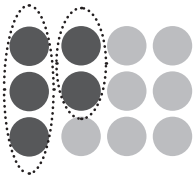
$\frac{25}{100}$ or $\frac{1}{4}$

e 

$\frac{75}{100}$ or $\frac{3}{4}$

Students may reduce the fractions or give a fraction out of 100. Either answer is correct.

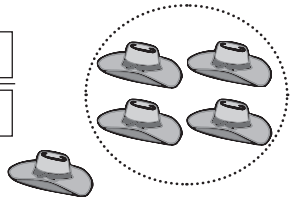
Fractions – fractions of a collection



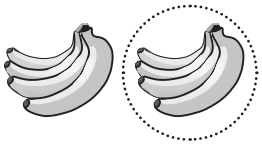
We can also have fractions of groups.
This is a group of 12 dots. 5 out of the 12 dots are circled.
We express this as $\frac{5}{12}$

1 **What fraction of each group has been circled?**

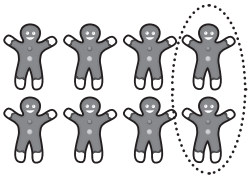
a $\frac{4}{5}$



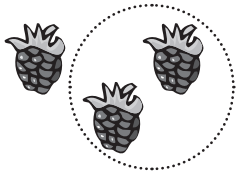
b $\frac{4}{8}$ or $\frac{1}{2}$



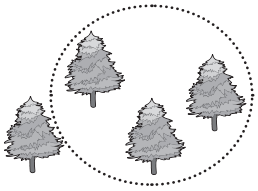
c $\frac{2}{8}$



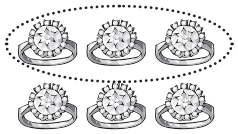
d $\frac{2}{3}$



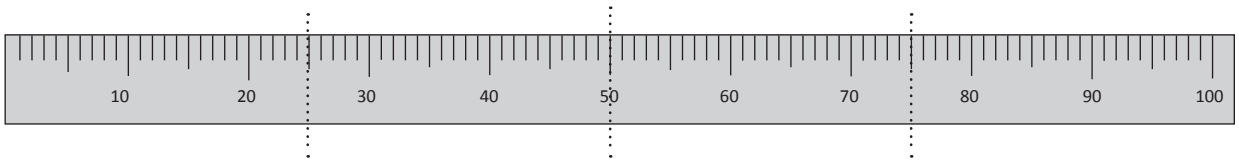
e $\frac{3}{4}$



f $\frac{3}{6}$



2 **Look at the metre ruler and work out how many centimetres are represented by the fraction:**

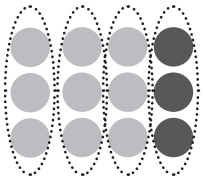


a $\frac{1}{4}$ m = 25 cm

b $\frac{1}{2}$ m = 50 cm

c $\frac{3}{4}$ m = 75 cm

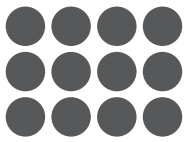
Sometimes we are asked to find the fraction of an amount such as:



Find one quarter of this array.
There are 12 dots in the array.
First we divide the array into 4 equal parts.
There are 3 dots in each part or quarter so one quarter of 12 is 3.

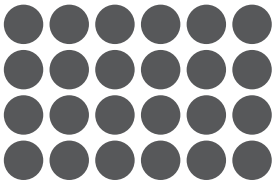
3 **Use the arrays to help find the given fractions of the groups:**

a $\frac{1}{3}$ of this array is 4 dots



$\frac{1}{6}$ of this same array is 2 dots

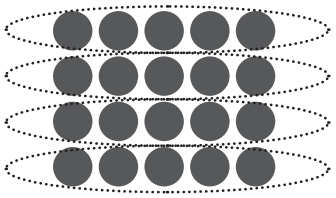
b $\frac{1}{4}$ of this array is 6 dots



$\frac{1}{6}$ of this same array is 4 dots

Fractions – fractions of a collection

There is another way to find fractions of amounts:
What is $\frac{1}{4}$ of 20?
20 divided into 4 groups is 5 in each group
20 ÷ 4 = 5



4 **Find the fractional amounts. You can use blocks or counters to help or solve the problems in your head using division:**

a $\frac{1}{5}$ of 20 = 4
20 ÷ 5 = 4

b $\frac{1}{4}$ of 12 = 3
12 ÷ 4 = 3

c $\frac{1}{3}$ of 18 = 6
18 ÷ 3 = 6

d $\frac{1}{6}$ of 18 = 3
18 ÷ 6 = 3

e $\frac{1}{5}$ of 15 = 3
15 ÷ 5 = 3

f $\frac{1}{9}$ of 27 = 3
27 ÷ 9 = 3

g $\frac{1}{2}$ of 14 = 7
14 ÷ 2 = 7

h $\frac{1}{7}$ of 21 = 3
21 ÷ 7 = 3

Once we know how to find one part of a group, we can use this to find other amounts:

To find $\frac{2}{3}$ of 9, we first find $\frac{1}{3}$ of 9 → 9 ÷ 3 = 3 $\frac{1}{3}$ of 9 = 3

$\frac{2}{3}$ of 9 is 2 times this → 2 x 3 = 6 $\frac{2}{3}$ of 9 = 6

5 **Find the fractional amounts. Use the space below to work out the different steps:**

a What is $\frac{2}{5}$ of 20?
20 ÷ 5 = 4
2 x 4 = 8
$\frac{2}{5}$ x 20 = 8

b What is $\frac{3}{4}$ of 12?
12 ÷ 4 = 3
3 x 3 = 9
$\frac{3}{4}$ x 12 = 9

c What is $\frac{2}{3}$ of 18?
18 ÷ 3 = 6
2 x 6 = 12
$\frac{2}{3}$ x 18 = 12

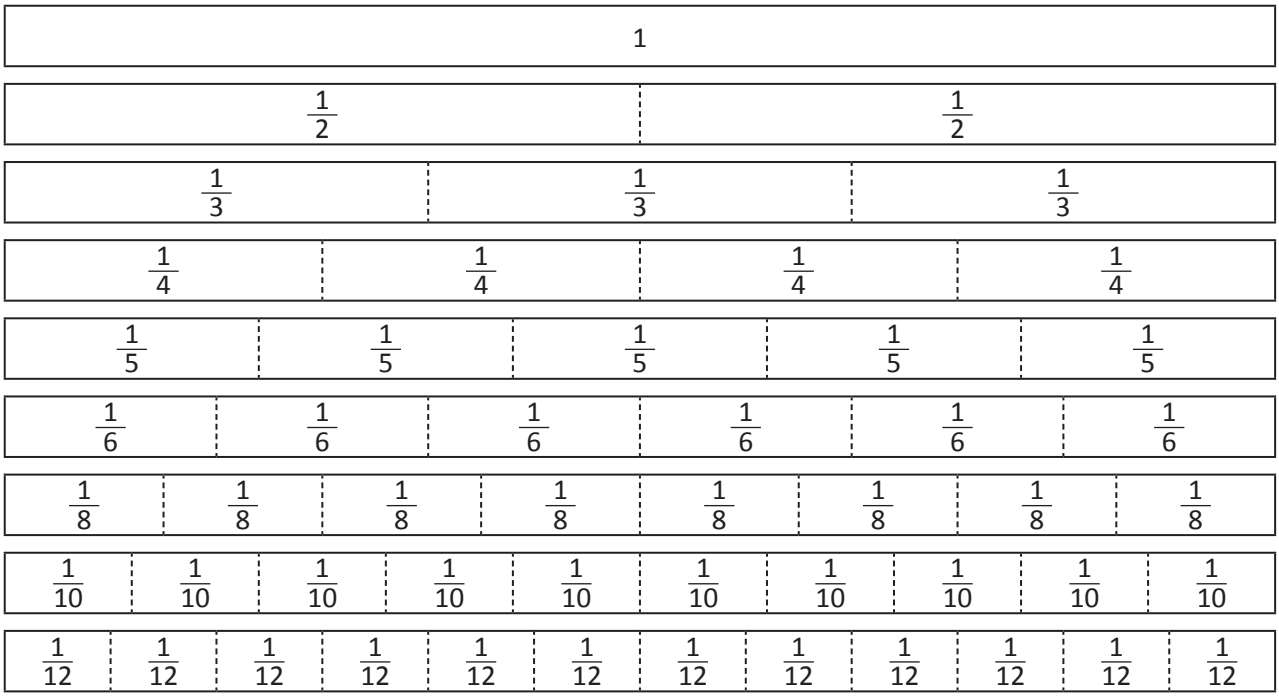
d What is $\frac{3}{4}$ of 16?
16 ÷ 4 = 4
3 x 4 = 12
$\frac{3}{4}$ x 16 = 12

e What is $\frac{2}{8}$ of 24?
24 ÷ 8 = 3
2 x 3 = 6
$\frac{2}{8}$ x 24 = 6

f What is $\frac{2}{7}$ of 14?
14 ÷ 7 = 2
2 x 2 = 4
$\frac{2}{7}$ x 14 = 4

Fractions – comparing and ordering fractions

We can use number lines or fraction strips to help us compare and order fractions.



1 **Use the strips above to help you answer the following questions. Circle the correct answers:**

a Which is bigger? (3/4) or 4/8

b Which is smaller? (2/10) or 2/8

c Which is smaller? 2/4 or (3/12)

2 **Use the fraction strips to:**

a Find 3 fractions that are the same as 1/2

2/4 3/6 4/8 or 5/10 or 6/12

b Find 2 fractions that are the same as 1/3

2/6 4/12

c Find the fraction that is greater than 2/3 but less than 3/4

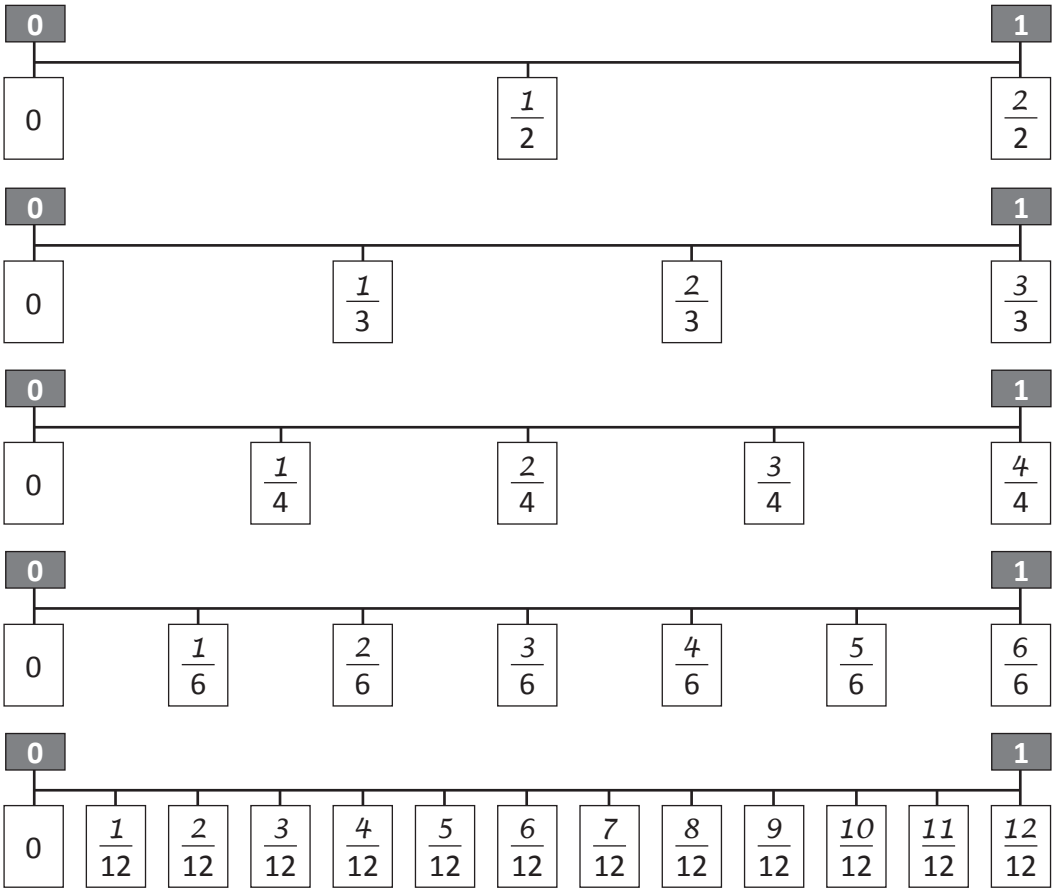
7/10

3 **Write 2 similar problems for a friend to solve:**

Answers will vary.

Fractions – comparing and ordering fractions

4 **Label the missing fractions on the number line:**



5 **Are these statements true or false? Use the number lines above to help you with your decision. Remember the large end < eats the large number.**

a $\frac{1}{3} < \frac{1}{2}$ — True

b $\frac{1}{4} > \frac{2}{6}$ — False

c $\frac{1}{2} > \frac{1}{3}$ — True

d $\frac{1}{4} < \frac{5}{12}$ — True

e $\frac{3}{4} > \frac{7}{12}$ — True

f $\frac{2}{3} > \frac{3}{4}$ — False

g $\frac{7}{12} > \frac{1}{4}$ — True

h $\frac{3}{12} > \frac{1}{6}$ — True

6 **Use the number lines above to help you put these fractions in order from smallest to largest:**

a $\frac{8}{12}$ $\frac{1}{2}$ $\frac{2}{6}$ — $\frac{2}{6}$ $\frac{1}{2}$ $\frac{8}{12}$

b $\frac{1}{4}$ $\frac{2}{6}$ $\frac{1}{12}$ — $\frac{1}{12}$ $\frac{1}{4}$ $\frac{2}{6}$

c $\frac{3}{4}$ $\frac{1}{2}$ $\frac{5}{12}$ — $\frac{5}{12}$ $\frac{1}{2}$ $\frac{3}{4}$

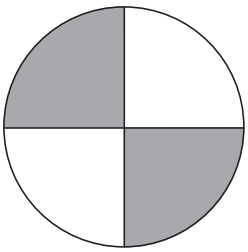
d $\frac{5}{6}$ $\frac{1}{3}$ $\frac{1}{4}$ — $\frac{1}{4}$ $\frac{1}{3}$ $\frac{5}{6}$

Find the fraction

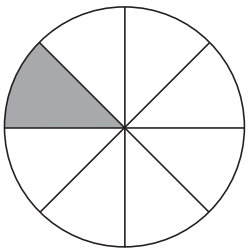
solve

What to do

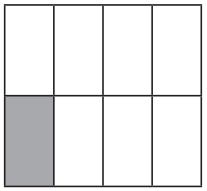
Your job is to work out what fraction of each shape is shaded. Some of them are simple to work out, others will take a little more thinking.



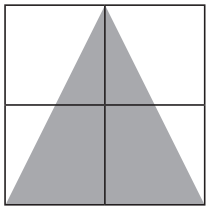
$\frac{2}{4}$ or $\frac{1}{2}$



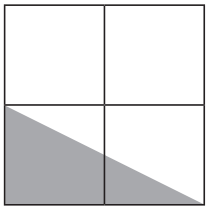
$\frac{1}{8}$



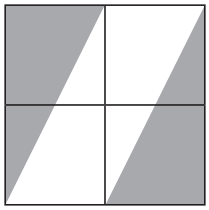
$\frac{1}{8}$



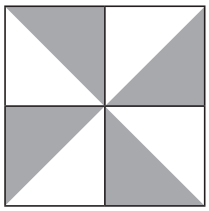
$\frac{2}{4}$ or $\frac{1}{2}$



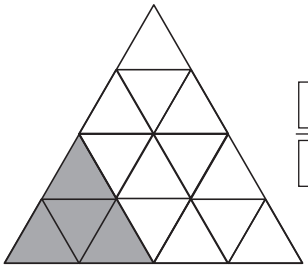
$\frac{1}{4}$



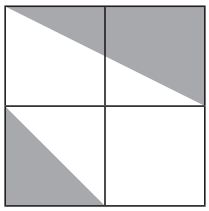
$\frac{2}{4}$ or $\frac{1}{2}$



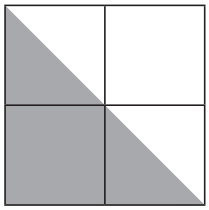
$\frac{4}{8}$ or $\frac{1}{2}$



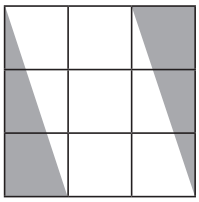
$\frac{4}{16}$ or $\frac{1}{4}$



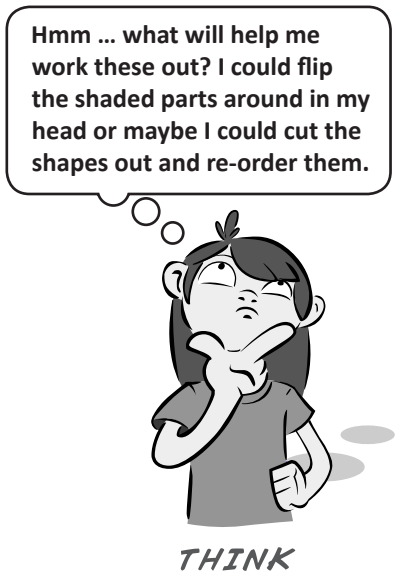
$\frac{3}{8}$

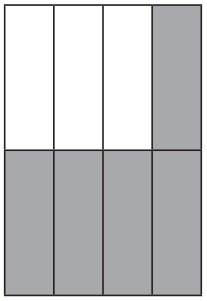


$\frac{2}{4}$ or $\frac{1}{2}$



$\frac{3}{9}$ or $\frac{1}{3}$



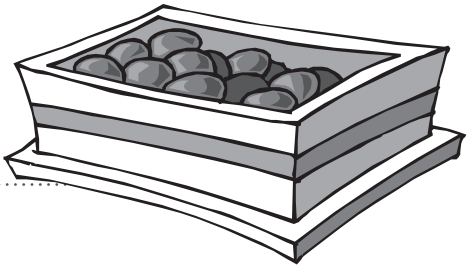


$\frac{5}{8}$

Mmmmm, chocolate … apply

Getting ready

In this activity you will use your knowledge of fractions to share chocolates amongst a family.



What to do

Mum gave you and your (imaginary) brothers and sisters a box of chocolates to share (also imaginary, unfortunately). She has decided to share them out based on how well you all cleaned your rooms. There are 72 chocolates in the box. Follow the directions to find how many you each receive:

a Your sister Sarah can have $\frac{1}{4}$ of the chocolates. How many chocolates is this?

18 chocolates

b Your sister Claire wished she had known this condition when she cleaned up her room. She can only have $\frac{1}{12}$ of the chocolates. How many is this?

6 chocolates

c Your brother Angus did a stellar job on his room and is entitled to $\frac{2}{6}$ of the chocolates. How many is this?

24 chocolates

d You get the rest! How many do you get?

24 chocolates

e What is your share expressed as a fraction?

$\frac{24}{72}$ *or* $\frac{1}{3}$

What to do next

Write an addition sentence to show how the chocolates were shared.

18 + 6 + 24 + 24 = 72

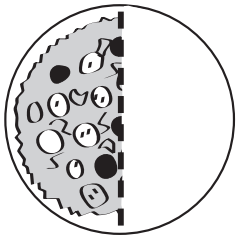
Now write a fraction addition sentence to show how they were shared.

$\frac{18}{72} + \frac{6}{72} + \frac{24}{72} + \frac{24}{72} = \frac{72}{72}$

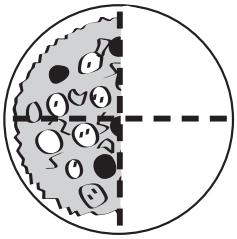
Types of fractions – equivalent fractions

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

This pizza has been cut into 2 parts. $\frac{1}{2}$ has been eaten.



This pizza has been cut into 4 parts. $\frac{2}{4}$ has been eaten.



1 **Do this folding paper activity to help you understand how equivalent fractions work:**

a You'll need a separate rectangular piece of paper similar to the one below. Fold it into 3 equal parts and then unfold it. Label each section with its fraction here:

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

b Refold your paper into thirds and fold the thirds into halves. Unfold the paper. What fraction does each of the new sections represent? Label them here:

$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

c Fold the paper back again and fold it in half once more. Unfold it and label the fractions here:

$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

2 **Use the diagrams in Question 1 to help you answer the following questions:**

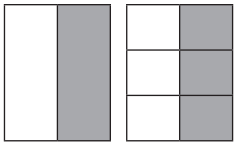
a What fractions can you find that are equivalent to $\frac{1}{3}$? $\frac{2}{6}$ $\frac{4}{12}$

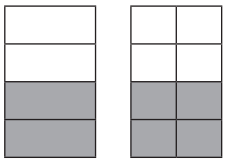
b What fractions can you find that are equivalent to $\frac{8}{12}$? $\frac{2}{3}$ $\frac{4}{6}$

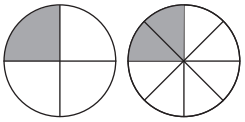
c What other fractions can you think of that might be equivalent to $\frac{6}{12}$? $\frac{1}{2}, \frac{4}{8}, \frac{5}{10} \ldots$

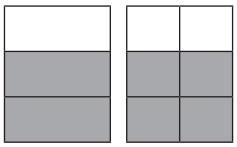
Types of fractions – equivalent fractions

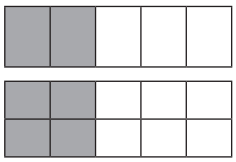
3 **Write the equivalent fraction for each of these:**

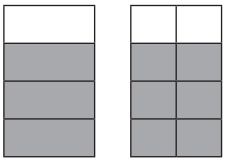
a  $\frac{1}{2} = \frac{3}{6}$

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

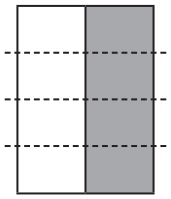
c  $\frac{1}{4} = \frac{2}{8}$

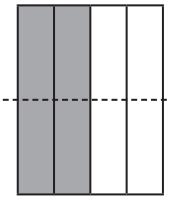
d  $\frac{2}{3} = \frac{4}{6}$

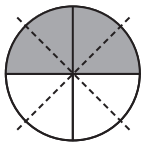
e  $\frac{2}{5} = \frac{4}{10}$

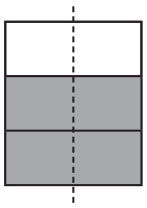
f  $\frac{3}{4} = \frac{6}{8}$

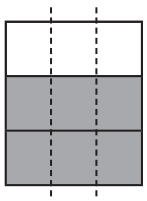
4 **Find an equivalent fraction for each of these. Divide the diagrams to create a different number of equal parts. The first one has been done for you.**

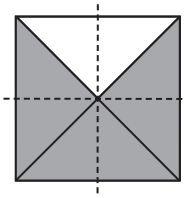
a  $\frac{1}{2} = \frac{4}{8}$

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

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

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

e  $\frac{2}{3} = \frac{6}{9}$

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

5 **Is $\frac{2}{8}$ equivalent to $\frac{1}{4}$? Use diagrams to help explain your reasoning:** *Yes*

Diagrams will vary.

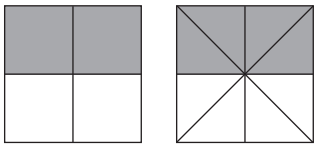
6 **Is $\frac{2}{3}$ equivalent to $\frac{5}{6}$? Use diagrams to help explain your reasoning:** *No*

Diagrams will vary.

Types of fractions – equivalent fractions

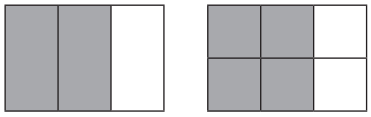
7 **This section has been completed by our work experience boy. How did he go? Give him some feedback:**

a



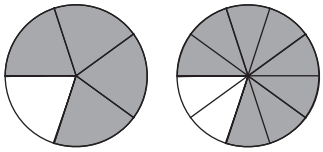
$\frac{2}{4} = \frac{4}{8}$

b



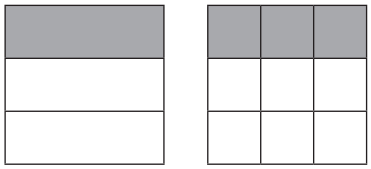
$\frac{2}{3} = \frac{4}{3}$

c



$\frac{4}{5} = \frac{8}{5}$

d



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

Your feedback:

a is correct.

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

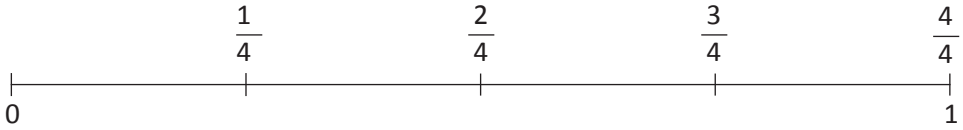
c $\frac{4}{5} = \frac{8}{10}$

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

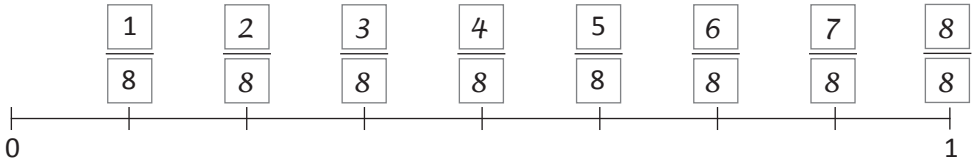
You have the numerators correct but your denominators are incorrect.

8 **Complete the number lines. The first has been done for you:**

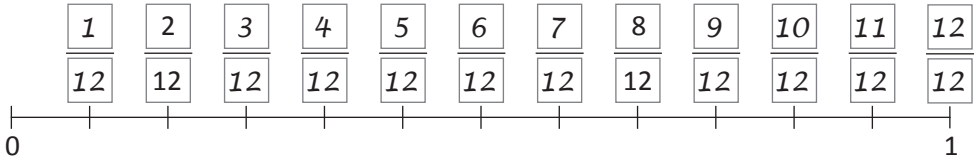
a



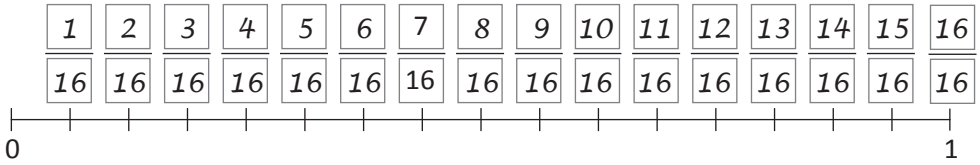
b



c



d



9 **Use the number lines to answer the following:**

a How many equivalent fractions can you find for $\frac{1}{4}$? $\frac{2}{8}, \frac{3}{12}, \frac{4}{16}, \frac{5}{20} \cdots$

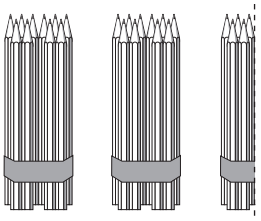
b Did you find a pattern? Can you continue it?

Yes – numerator increases by one, denominator goes up in 4s.

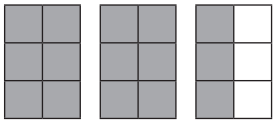
Types of fractions – mixed numerals and improper fractions

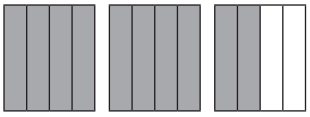
Mixed numerals consist of both a whole number and a fraction.
Ky has 2 full packets of pencils and one half packet of pencils.

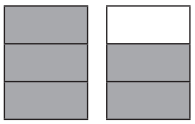
This is shown as $2\frac{1}{2}$

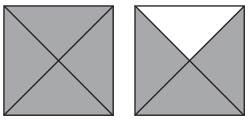


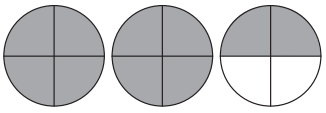
1 **Write a mixed numeral for each of the shaded sets of shapes:**

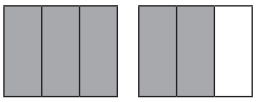
a  = $2\frac{1}{2}$ or $\frac{3}{6}$

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

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

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

e  = $2\frac{1}{2}$ or $\frac{2}{4}$

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

2 **Draw some diagrams or pictures that would represent:** *Diagrams will vary.*

a

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

b

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

c

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

d

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

3 **What might the missing numbers be?** *Sample answers.*

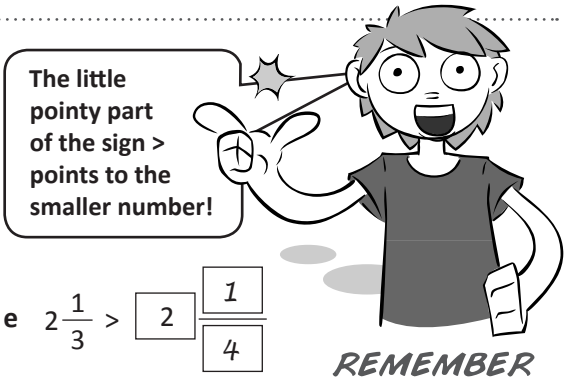
a $1\frac{1}{2} > 1\frac{1}{4}$

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

c $1\frac{1}{5} < 1\frac{2}{5}$

d $2\frac{3}{6} > 2\frac{1}{4}$

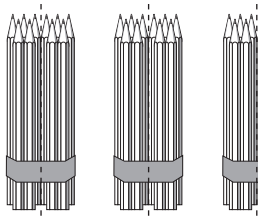
e $2\frac{1}{3} > 2\frac{1}{4}$



Types of fractions – mixed numerals and improper fractions

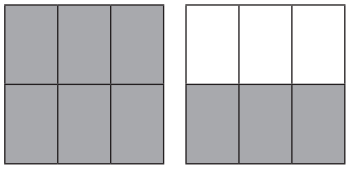
Mixed numerals can also be written as improper fractions.
Look again at Ky's full packets and one half packet of pencils.
This is five halves.

Written as an improper fraction, this is $\frac{5}{2}$.



4 **Express these as fractions. Circle any improper fractions:**

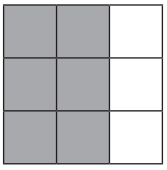
a



1 1

$\frac{9}{6}$

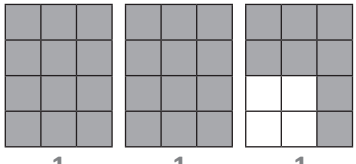
b



1

$\frac{6}{9}$

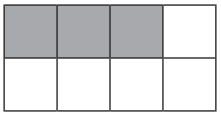
c



1 1 1

$\frac{32}{12}$

d

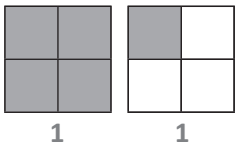


1

$\frac{3}{8}$

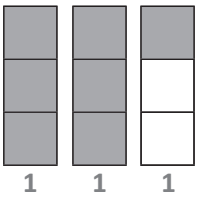
5 **Colour the shapes to create the following improper fractions. Remember each shape is one whole.**

a $\frac{5}{4}$



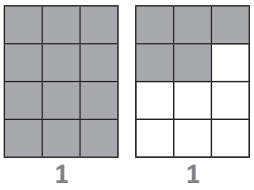
1 1

b $\frac{7}{3}$



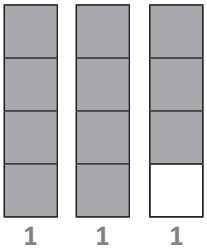
1 1 1

c $\frac{17}{12}$



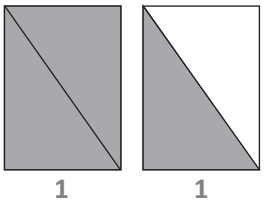
1 1

d $\frac{11}{4}$



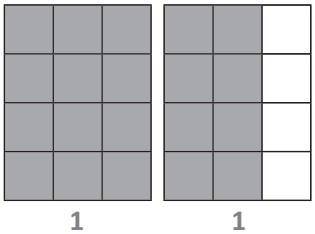
1 1 1

e $\frac{3}{2}$



1 1

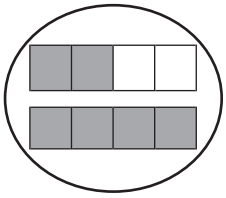
f $\frac{20}{12}$



1 1

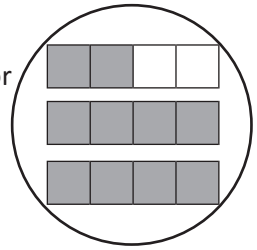
6 **Which is bigger? Circle the larger fraction:**

a $\frac{5}{4}$ or



b $\frac{3}{2}$ or

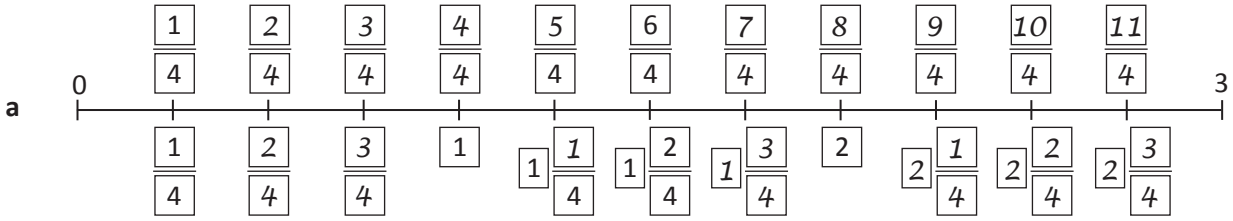
c $\frac{9}{4}$ or



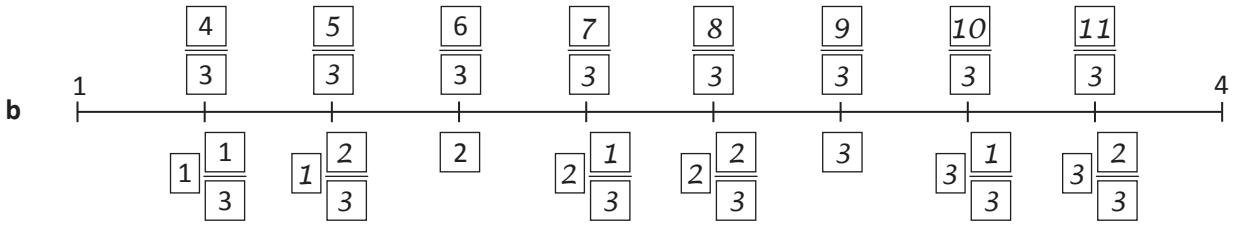
Types of fractions – mixed numerals and improper fractions

7 **Complete the number lines by filling in the boxes:**

a



b



8 **Use your completed number lines to help you answer these questions:**

a What is $2\frac{1}{4}$ expressed as an improper fraction?

$\frac{9}{4}$

b Write $\frac{13}{11}$ as a mixed number.

$1\frac{2}{11}$

c Find an improper fraction that is greater than $1\frac{1}{3}$ but less than $\frac{10}{3}$.

$\frac{\square}{\square}$

Possible answers:

$\frac{5}{3}, \frac{6}{3}, \frac{7}{3}, \frac{8}{3}, \frac{9}{3}$

d Your teacher offers you the choice between $\frac{10}{4}$ or $2\frac{1}{4}$ hours of rubbish duty. Are they doing you any favours?

$\frac{10}{4} = 2\frac{2}{4}$ $(2\frac{1}{2})$ hours

9 **Show the improper fractions. The number line at the top of the page will help:**

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

b $2\frac{1}{3} = \frac{7}{3}$

c $2\frac{1}{4} = \frac{9}{4}$

d $\frac{7}{3} = 2\frac{1}{3}$

e $\frac{7}{4} = 1\frac{3}{4}$

f $\frac{5}{3} = 1\frac{2}{3}$

g $\frac{6}{4} = 1\frac{2}{4}$

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

i $\frac{11}{4} = 2\frac{3}{4}$

Equivalent fraction snap

apply

Getting ready

Play this game with a friend. You'll need two sets of these cards. Make 2 copies of this page, cut out the cards and combine the two sets into one pile.

What to do

Player 1 deals the cards face down between the two players. Player 2 starts the game by placing a card in the centre. Players take turns in turning over the top card on their pile and placing it in the centre pile. Call, "Snap!" and take the centre pile if the card is identical to or an equivalent fraction to the card already face up.

The four wild cards can be used to make a Snap! When playing a wild card, you must name a correct equivalent fraction. The person with all the cards at the end is the winner.

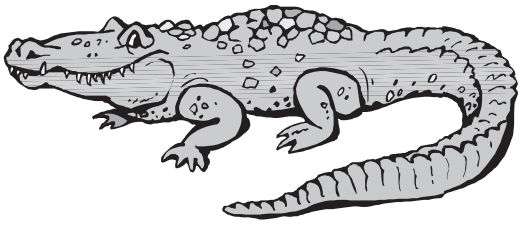
$\frac{2}{3}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{4}{8}$
$\frac{?}{?}$ WILD CARD	$\frac{4}{6}$	$\frac{2}{4}$	$\frac{3}{12}$
$\frac{4}{16}$	$\frac{9}{12}$	$\frac{?}{?}$ WILD CARD	$\frac{3}{4}$
$\frac{2}{8}$	$\frac{8}{12}$	$\frac{10}{20}$	$\frac{50}{100}$
$\frac{12}{16}$	$\frac{25}{100}$	$\frac{11}{44}$	$\frac{75}{100}$

Feeding time

apply

Getting ready

Emma is confused. She understands mixed numerals but not improper fractions. Her dad has asked her to help out at their wildlife zoo but he has used improper fractions in his directions.



What to do

Shade the correct amounts on the containers, then convert the improper fractions to mixed numerals for Emma so the animals can be fed correctly.

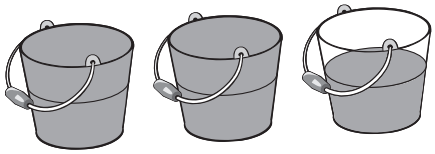
Dear Em,

Off to see a man about an iguana. Be a love and feed the animals for me, will you? Back for the afternoon feed.

At 6 am, feed the lambs $\frac{6}{4}$ cups of pellets.

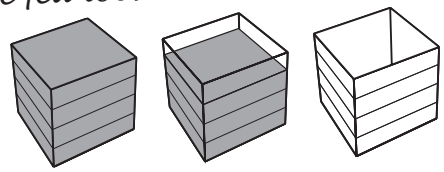
_____ cups

At 9 am, give Cuddli the croc her $\frac{5}{2}$ buckets of steak. (Remember Cuddli considers your hand to be one of her favourite food groups).



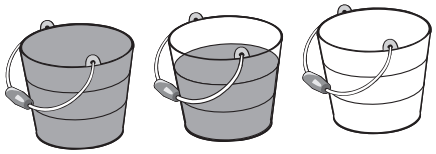
_____ buckets

At 11 am, feed the snakes their $\frac{7}{4}$ boxes of rats. Stop grimacing. Snakes deserve to be fed too.



_____ boxes

At midday, feed the wombats their $\frac{5}{3}$ buckets of mushrooms and grass. They won't be out for it till the evening but they want it now. Who would have thought wombats would be so precious? Go figure…



_____ buckets

Dad xxx

Fractions, decimals and percentages – tenths

Decimal fractions also express parts of a whole. This strip has been divided into 10 equal parts. Three out of ten or $\frac{3}{10}$ is shaded.

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

We can also express this as 0.3. There are no whole units and 3 tenths.

1 **Write the shaded common fraction and its equivalent decimal fraction:**

a

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

$\frac{6}{10}$ = 0.6

b

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

$\frac{4}{10}$ = 0.4

c

$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

$\frac{3}{10}$ = 0.3

2 **Shade the fraction strips to match the common fraction or decimal fraction:**

a 0.8

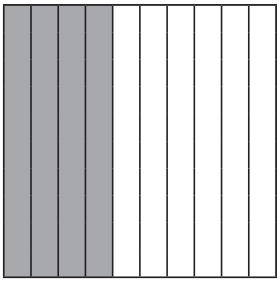
b $\frac{5}{10}$

c 0.4

d 0.9

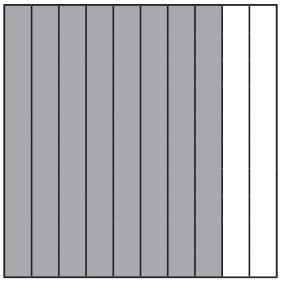
3 **Use a ruler and a pencil to divide the wholes into tenths. Shade the given amounts and express as decimals:**

a



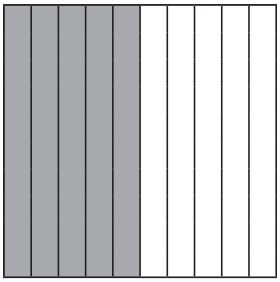
$\frac{4}{10}$ = 0.4

b



$\frac{8}{10}$ = 0.8

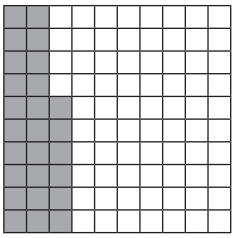
c



$\frac{5}{10}$ = 0.5

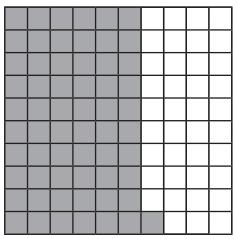
Fractions, decimals and percentages – tenths and hundredths

A hundredth is a tenth of a tenth.
Here, 26 hundredths have been shaded.
We write this as **0.26**
There are no units, 2 tenths and 6 hundredths.



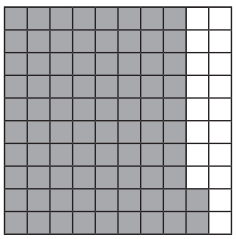
1 **Use a ruler and a pencil to divide these into hundredths and then shade the specified amounts:**

a



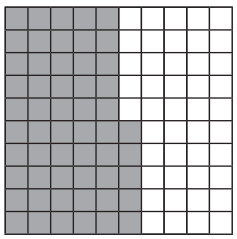
$\frac{61}{100}$ | 0 • 6 | 1

b



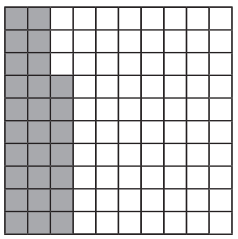
$\frac{82}{100}$ | 0 • 8 | 2

c



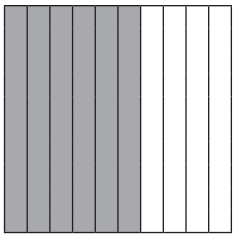
$\frac{55}{100}$ | 0 • 5 | 5

d

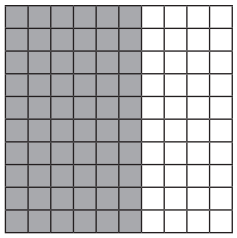


$\frac{27}{100}$ | 0 • 2 | 7

Six tenths are shaded here.



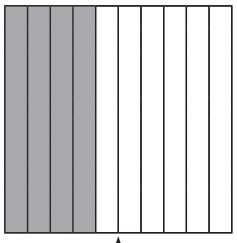
Sixty hundredths are shaded here.



What do you notice? Sixty hundredths and six tenths have the same value 0.60 = 0.6

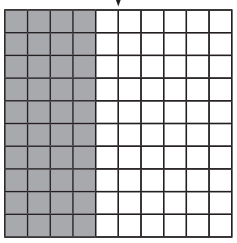
2 **Check that the above statement is true by shading the amounts. Are they the same?** *Yes*

a

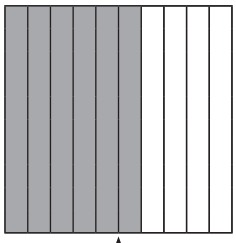


4 tenths

40 hundredths

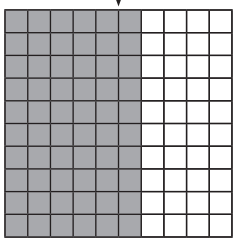


b

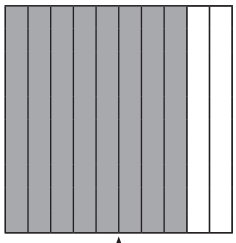


6 tenths

60 hundredths

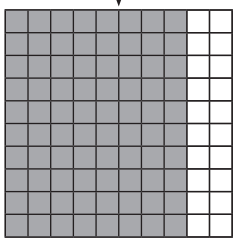


c

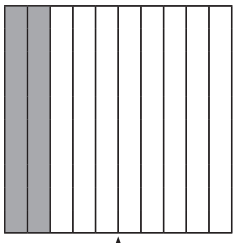


8 tenths

80 hundredths

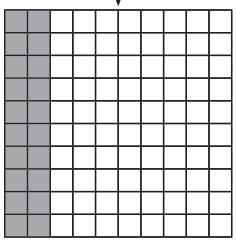


d



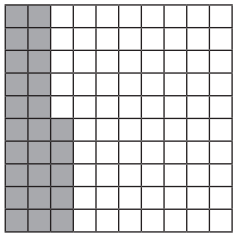
2 tenths

20 hundredths



3 **Complete these statements. The first one has been done for you.**

a

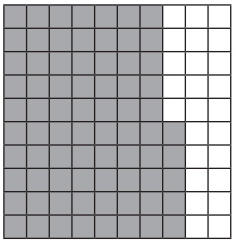


This is $\frac{25}{100}$

It can be renamed as:

$\frac{2}{10}$ and $\frac{5}{100}$

b

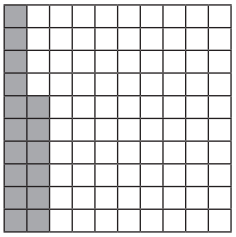


This is $\frac{75}{100}$

It can be renamed as:

$\frac{7}{10}$ and $\frac{5}{100}$

c

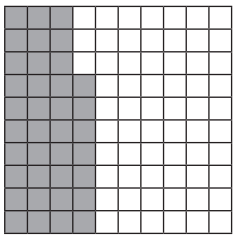


This is $\frac{16}{100}$

It can be renamed as:

$\frac{1}{10}$ and $\frac{16}{100}$

d

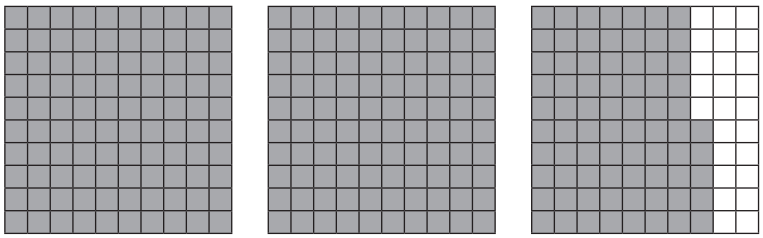


This is $\frac{37}{100}$

It can be renamed as:

$\frac{3}{10}$ and $\frac{7}{100}$

e



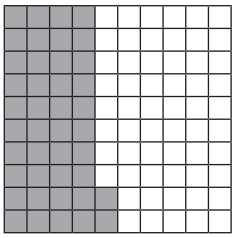
This represents 2 wholes and $\frac{75}{100}$

It can be renamed as:

2 wholes, $\frac{7}{10}$ and $\frac{5}{100}$

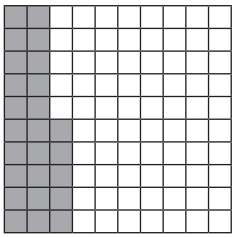
4 **Complete the missing information:**

a



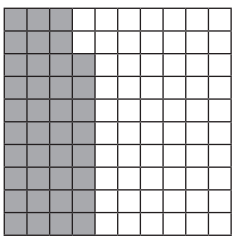
$\frac{42}{100} = \frac{4}{10} + \frac{2}{100} =$ 0.42

b



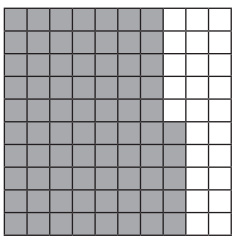
$\frac{25}{100} = \frac{2}{10} + \frac{5}{100} =$ 0.25

c



$\frac{38}{100} = \frac{3}{10} + \frac{8}{100} =$ 0.38

d



$\frac{75}{100} = \frac{7}{10} + \frac{5}{100} =$ 0.75

Fractions, decimals and percentages – place value to thousandths

A thousandth is a tenth of a hundredth.

Units		Tenths	Hundredths	Thousandths
2	•	2	5	6

This number has 2 units, 2 tenths, 5 hundredths and 6 thousandths.

1 **Write these numbers in the place value chart:**

	Thousands	Hundreds	Tens	Units	Tenths	Hundredths	Thousandths
a five tens, 3 units and eight tenths			5	3 •	8		
b 7 hundreds, 8 tens, four units, two tenths and 3 hundredths		7	8	4 •	2	3	
c nine tens, 8 tenths and 4 thousandths			9	0 •	8	0	4
d 6 hundreds, eight tenths, 4 hundredths and 3 thousandths		6	0	0 •	8	4	3
e four units, nine tenths and eight hundredths				4 •	9	8	
f three units, four tenths and two hundredths				3 •	4	2	
g 2 tens, 3 units, four hundredths and six thousandths			2	3 •	0	4	6
h 8 thousandths				0 •	0	0	8

2 **Answer true or false to the following questions. Score 0.5 points for each correct answer.**

	T or F	Score
a The value of 4 in 56.48 is 4 hundredths.	F	
b The value of 3 in 38.65 is 3 tens.	T	
c The value of 7 in 0.75 is 7 hundredths.	F	
d Thomas thought of a decimal number between 5.61 and 5.91. The number could have been 5.64.	T	
e The value of 8 in 9.998 is 8 thousandths.	T	
f 97.3 is nine tens, seven units and three hundredths.	F	
	Total	

Fractions, decimals and percentages – place value to thousandths

When comparing and ordering decimals, the place value of a digit is crucial. The further the digit is to the left, the greater its value.

Even though one thousandth sounds big, it is actually very small. Remember, one thousandth is just a single piece of a whole divided into a thousand parts. One tenth is actually one hundred times bigger than one thousandth.

3 **Which is bigger? Circle the correct answer:**

a (0.7) or 0.07 **b** 0.56 or (6 tenths) **c** (7.5) or $\frac{7}{10}$

d (15) or 0.15 **e** ($\frac{1}{2}$) or 0.25 **f** (35) or 0.035

4 **Use < or > or = to show the relationship between the two numbers:**

a 6.89 __>__ 6.76 **b** 70.908 __>__ 7.908 **c** 9.08 __<__ 9.8

d 5.098 __<__ 5.98 **e** 0.56 __=__ 0.560 **f** 11.80 __=__ 11.8

5 **This chart shows the vital statistics of some Roosters Football Club players.**

Name	Height	Weight
Lanky	2.06 m	79.054 kg
Crusher	1.96 m	110.652 kg
Crumber	1.73 m	79.934 kg
Cazaly	1.84 m	88.91 kg
Stomper	1.81 m	99.552 kg
Whale	2.01 m	118.236 kg
Twinkle Toes	*1.74 m - 1.83 m*	65.789 kg

a Who is tallest? Who is shortest?

Lanky – tallest *Crumber – shortest*

b Put these players in order of lightest to heaviest: Crumber, Stomper, Cazaly:

Crumber (79.934 kg), Cazaly (88.91 kg), Stomper (99.552 kg)

c Which 2 players would you have playing in the ruck? (Rucks have to be tall.)

Lanky and Whale

d Who would you least like to have tackle you? Why?

Whale – he is the heaviest.

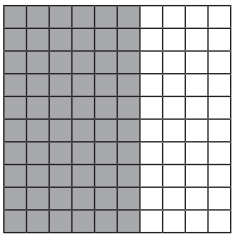
e Twinkle Toes twirled out of the club before his height was measured. We know he is taller than Crumber and shorter than Cazaly. What could his height be? Add it to the table.

Fractions, decimals and percentages – percentages

Percent means part per hundred and is expressed using the symbol %.

Here, 60% has been shaded grey.

It is the same as 60 hundredths. $\frac{60}{100} = 0.60 = 60\%$

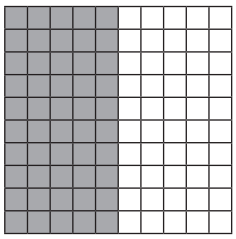


1 **Think of at least five times you see the % sign or use percentages:**

Answers will vary.

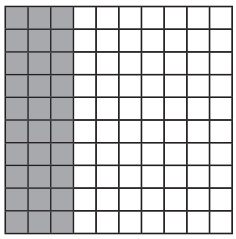
2 **Fill in the missing values and shade the grids:**

a



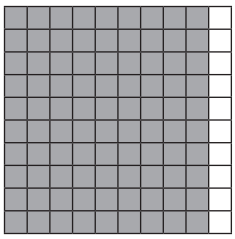
$\frac{50}{100}$	0.5	50%

b



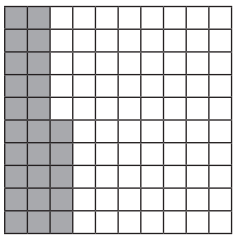
$\frac{30}{100}$	0.3	30%

c



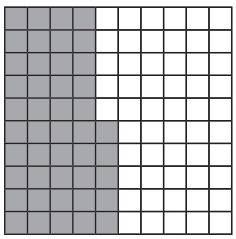
$\frac{90}{100}$	0.9	90%

d



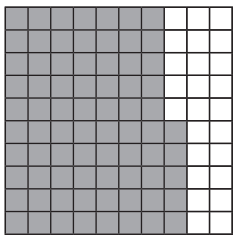
$\frac{25}{100}$	0.25	25%

e



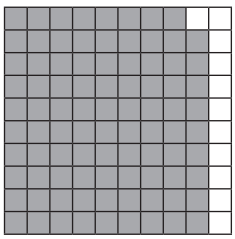
$\frac{45}{100}$	0.45	45%

f



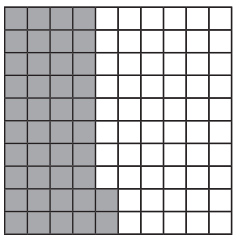
$\frac{75}{100}$	0.75	75%

g



$\frac{89}{100}$	0.89	89%

h



$\frac{42}{100}$	0.42	42%

3 **Are these statements correct?**

a 75% is greater than 0.5 — *True*

b One quarter is the same as 50% — *False*

c 45% is greater than 0.5 — *False*

d 0.42 is equivalent to 425 — *False*

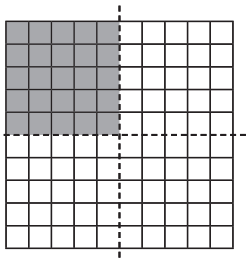
e You score 100% on a test. Your friend scores 20/20. You both received the same score. — *True*

Fractions, decimals and percentages – percentages

It is useful to know some common percentages such as 25%, 50% or 75%.

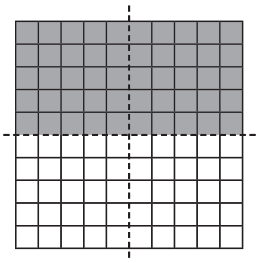
4 **Shade the grids and show the following fractions by completing the missing information:**

a



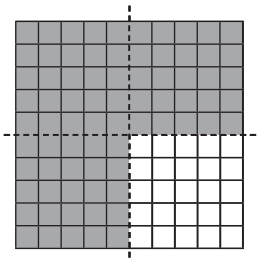
$\frac{1}{4}$	0.25	25%

b



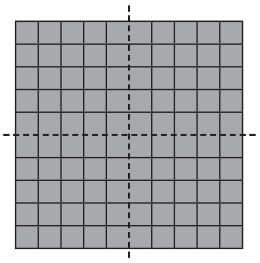
$\frac{1}{2}$	0.50	50%

c



$\frac{3}{4}$	0.75	75%

d



$\frac{4}{4}$	1.0	100%

5 **Shade these shapes to show the following percentages:**

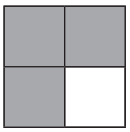
a

50%

b

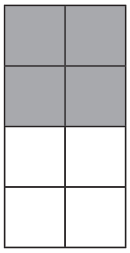
25%

c



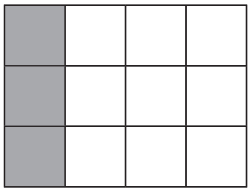
75%

d



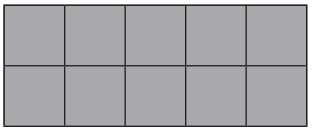
50%

e



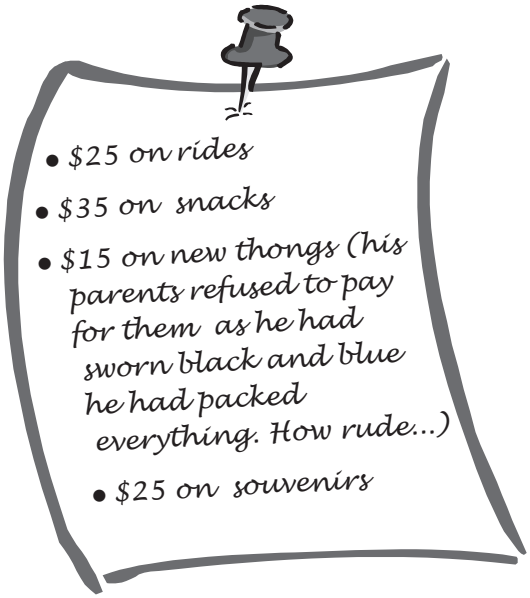
25%

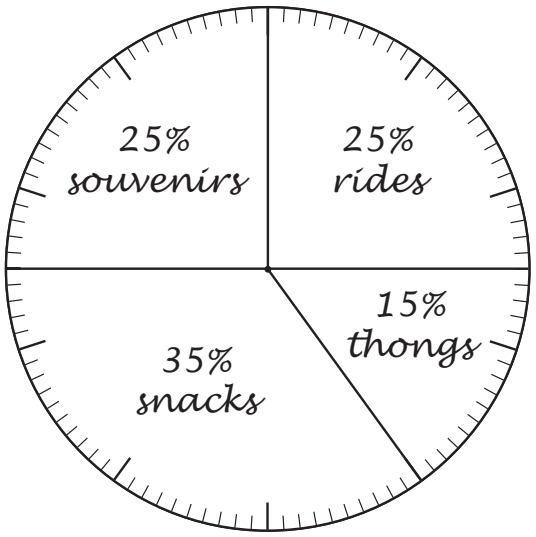
f



100%

6 **James goes on holiday. He has $100 spending money and spends it as outlined below. Show this on the pie graph and label each section of the pie with the correct percentage:**





Match 'n' snap

apply

Getting ready

This is a game for 2 or more players. You will race against each other to come up with equivalent fractions, decimals or percentages to match those on cards. You'll need one copy of this page and one copy of page 25 between you.

What to do

Cut out the playing cards, mix them up and put them face down in a pile.

Cut out the blank cards on page 25 and divide them between the two of you. Make sure you both have a pencil each.

Turn over the first playing card. Both players write an equivalent fraction, decimal or percentage to match it on one of the blank cards and cover the playing card as quickly as possible.

For example, the playing card may say 50% – you could write $\frac{1}{2}$ or $\frac{5}{10}$ or $\frac{50}{100}$.

The first person to cover the card with a correct match wins and takes the pair. The player at the end of the game with the most cards is the winner.

Playing Cards

$\frac{75}{100}$	25%	$\frac{3}{4}$	$\frac{1}{4}$
0.5	0.25	$\frac{1}{2}$	50%
0.1	$\frac{1}{10}$	10%	0.75

Blank Cards

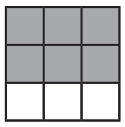
Calculating – adding and subtracting fractions with like denominators

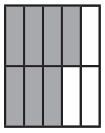
I ate $\frac{2}{4}$ of a cake for breakfast. Then I ate another $\frac{1}{4}$ for lunch. How many quarters did I eat altogether?

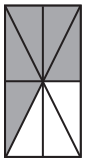
$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

1 **Shade the shapes to help you answer the problems:**

a  $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

b  $\frac{3}{9} + \frac{3}{9} = \frac{6}{9}$

c  $\frac{4}{10} + \frac{3}{10} = \frac{7}{10}$

d  $\frac{3}{8} + \frac{2}{8} = \frac{5}{8}$

2 **Try these. Draw some diagrams if that will help you.**

a $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$

b $\frac{2}{7} + \frac{3}{7} = \frac{5}{7}$

c $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{3}{4}$

d $\frac{1}{10} + \frac{5}{10} + \frac{1}{10} = \frac{7}{10}$

3 **Write addition fraction sentences for the following problems. Write your answers:**

a $\frac{1}{3}$ of the kids in Bailey's class played basketball at recess. $\frac{1}{3}$ of the kids played football. $\frac{1}{3}$ of the kids sat round and chatted. What fraction of the class played sport?

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

b Josh spent $\frac{1}{5}$ of his pocket money at the milk bar and $\frac{2}{5}$ buying credits for his game. Write a fraction sentence to show the fraction he spent.

$\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$

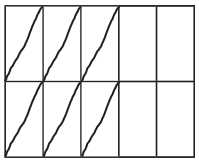
4 **Look at the problem $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$. Why does the 4 stay as 4 – why isn't it $\frac{2}{4} + \frac{1}{4} = \frac{3}{8}$?**

When we add fractions, we only add the numerators. The denominators don't change because we have not changed the way the whole has been split.

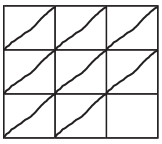
Calculating – adding and subtracting fractions with like denominators

I had $\frac{3}{4}$ of a cake in the fridge. I ate $\frac{1}{4}$. I had $\frac{2}{4}$ left. $\frac{3}{4} - \frac{1}{4} = \frac{2}{4}$

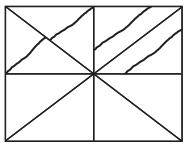
5 **Find answers to these subtraction problems. The first one has been done for you.**

a 

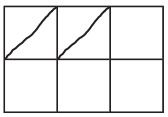
$\frac{10}{10} - \frac{6}{10} = \frac{4}{10}$

b 

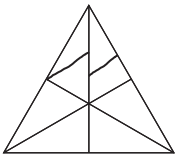
$\frac{9}{9} - \frac{8}{9} = \frac{1}{9}$

c 

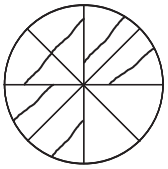
$\frac{8}{8} - \frac{4}{8} = \frac{4}{8}$

d 

$\frac{6}{6} - \frac{2}{6} = \frac{4}{6}$

e 

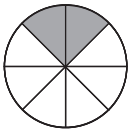
$\frac{6}{6} - \frac{2}{6} = \frac{4}{6}$

f 

$\frac{8}{8} - \frac{6}{8} = \frac{2}{8}$

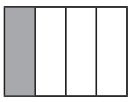
6 **Use the diagrams to help you solve these problems:**

a Marita cut her birthday cake into 8 equal slices and ate 2 of them straight away. What fraction was left?



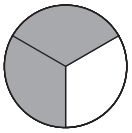
$\frac{6}{8}$

b Sam played a soccer game. He played goalie for 1 quarter of the game and in attack for the rest. What fraction of the game did he spend in attack?



$\frac{3}{4}$

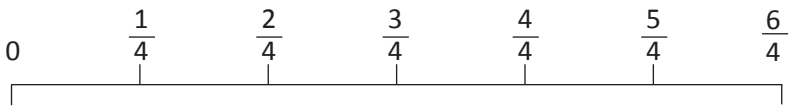
c Jacinta spent $\frac{1}{3}$ of her pocket money on chocolate and $\frac{1}{3}$ of it on a magazine. What fraction did she have left?



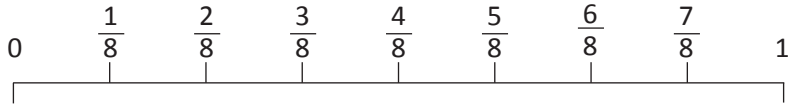
$\frac{1}{3}$

7 **Use the number lines to help you work out the answers to these problems:**

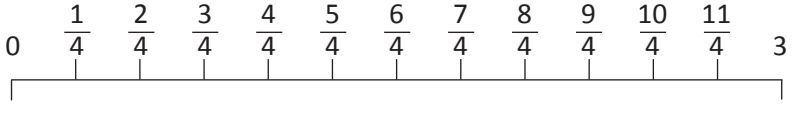
a $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$



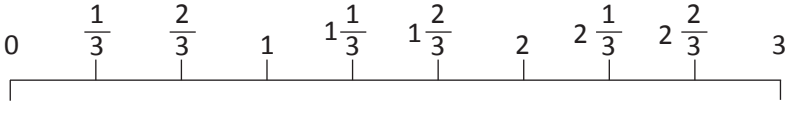
b $\frac{7}{8} - \frac{3}{8} = \frac{4}{8}$



c $\frac{6}{4} - \frac{3}{4} = \frac{3}{4}$

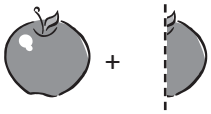


d $2\frac{2}{3} - \frac{1}{3} = 2\frac{1}{3}$



Calculating – adding and subtracting fractions to and from a whole

Adding fractions to whole numbers is a simple process.



$= 1\frac{1}{2}$ $\qquad 1 + \frac{1}{2} = 1\frac{1}{2}$

1 **Add these fractions and whole numbers:**

a $2 + \frac{1}{2} = \boxed{2}\ \frac{\boxed{1}}{\boxed{2}}$ **b** $4 + \frac{1}{3} = \boxed{4}\ \frac{\boxed{1}}{\boxed{3}}$ **c** $3 + \frac{3}{4} = \boxed{3}\ \frac{\boxed{3}}{\boxed{4}}$

d $\frac{1}{2} + 5 = \boxed{5}\ \frac{\boxed{1}}{\boxed{2}}$ **e** $\frac{2}{3} + 4 = \boxed{4}\ \frac{\boxed{2}}{\boxed{3}}$ **f** $\frac{4}{7} + 9 = \boxed{9}\ \frac{\boxed{4}}{\boxed{7}}$

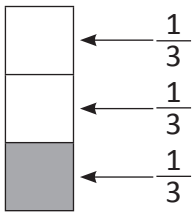
g $\frac{1}{2} + \boxed{6} = 6\frac{1}{2}$ **h** $\boxed{2} + \frac{2}{3} = 2\frac{2}{3}$ **i** $\frac{1}{5} + \boxed{2}\ \frac{\boxed{2}}{\boxed{5}} = 2\frac{3}{5}$

How do we subtract fractions from a whole? We rename the wholes to make it simpler.

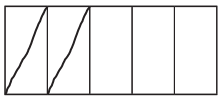
Look at the problem $1 - \frac{1}{3}$.

How many $\frac{1}{3}$ are in 1 whole? There are $\frac{3}{3}$ in a whole.

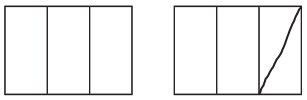
Now the problem is easier: $\frac{3}{3} - \frac{1}{3} = \frac{2}{3}$



2 **Rename the wholes as fractions and use the diagrams to help you solve these problems:**

a $1 - \frac{2}{5} =$ 

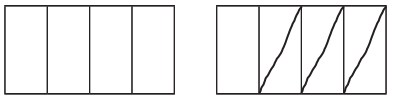
$= \frac{3}{5}$

b $2 - \frac{1}{3} =$ 

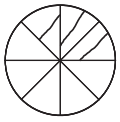
$= 1\frac{2}{3}$

c $1 - \frac{1}{4} =$ 

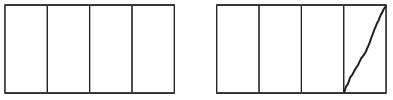
$= \frac{3}{4}$

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

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

e $1 - \frac{3}{8} =$ 

$= \frac{5}{8}$

f $2 - \frac{1}{4} =$ 

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

Calculating – adding and subtracting fractions

1 **What could the missing numbers be? Create two different options for each:**

a $\frac{1}{4} + \frac{3}{4} = \frac{4}{4}$

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

b $\frac{\square}{8} - \frac{\square}{8} = \frac{\square}{8}$

$\frac{\square}{\square} - \frac{\square}{\square} = \frac{\square}{\square}$

Answers will vary.

c $\square\frac{\square}{\square} + \frac{\square}{\square} = \square\frac{\square}{\square}$

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

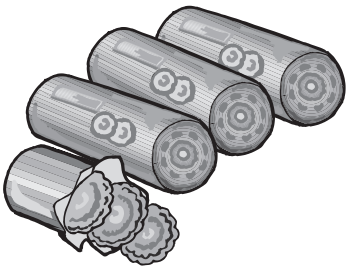
Answers will vary.

d $\square\frac{\square}{\square} + \square\frac{\square}{\square} = \square\frac{\square}{\square}$

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

Answers will vary.

2 **Solve these problems. Draw diagrams if they help:**



a You have $3\frac{1}{4}$ packets of cookies. One friend eats $\frac{1}{4}$ packet, another eats $\frac{2}{4}$ and another eats $\frac{1}{4}$. What fraction do you have left?

$2\frac{1}{4}$

b What fractions do you know that have a difference of $\frac{1}{4}$?

Answers will vary.

Calculating – adding decimal fractions

How do we add decimal fractions using a written strategy?

We arrange the numbers so the place values line up and then we start with the smallest value.

We first add the tenths. 6 tenths and 7 tenths is 13 tenths.

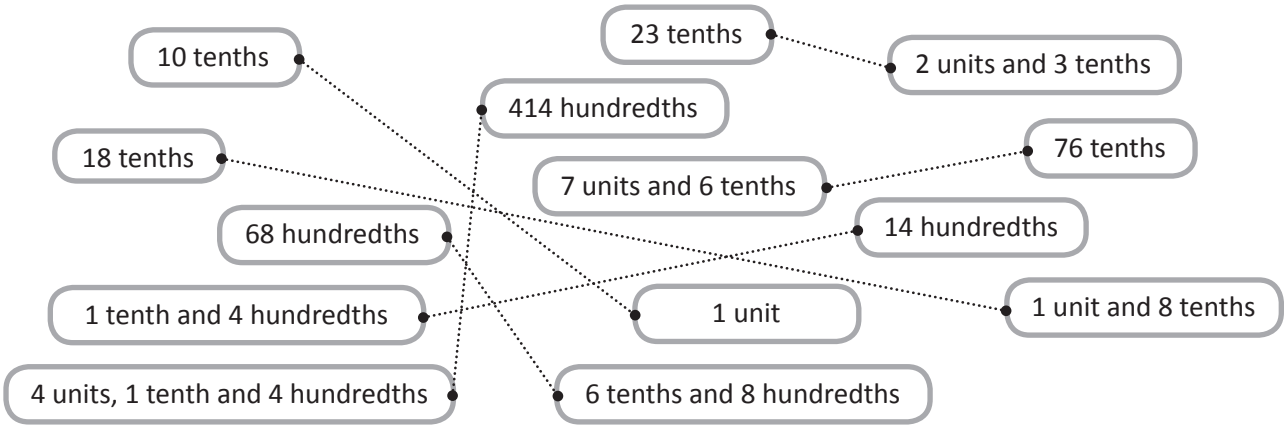
We rename this as 1 unit and 3 tenths.

We write the 3 in the tenths column and move the unit to the units column.

Then we add the units. 1 + 1 + 4 = 6

$$\begin{array}{r} {}^{1}1.6 \\ +\ 4.7 \\ \hline 6.3 \end{array}$$

1 **Knowing how to rename is a useful skill when adding decimal fractions. Practise your renaming skills here by colour coding the matching boxes:**



2 **Add these decimal fractions:**

a
$$\begin{array}{r} 2.6 \\ +\ 3.3 \\ \hline 5.9 \end{array}$$

b
$$\begin{array}{r} 4.7 \\ +\ 5.4 \\ \hline 10.1 \end{array}$$

c
$$\begin{array}{r} 5.4 \\ +\ 3.5 \\ \hline 8.9 \end{array}$$

d
$$\begin{array}{r} 1.5 \\ +\ 12.3 \\ \hline 13.8 \end{array}$$

e
$$\begin{array}{r} 18.6 \\ +\ 11.2 \\ \hline 29.8 \end{array}$$

f
$$\begin{array}{r} 9.4 \\ +\ 3.7 \\ \hline 13.1 \end{array}$$

3 **Now try these. Start with the hundredths and remember to rename if neccessary:**

a
$$\begin{array}{r} 3.46 \\ +\ 5.23 \\ \hline 8.69 \end{array}$$

b
$$\begin{array}{r} 4.72 \\ +\ 3.19 \\ \hline 7.91 \end{array}$$

c
$$\begin{array}{r} 7.36 \\ +\ 5.65 \\ \hline 13.01 \end{array}$$

Calculating – adding decimal fractions

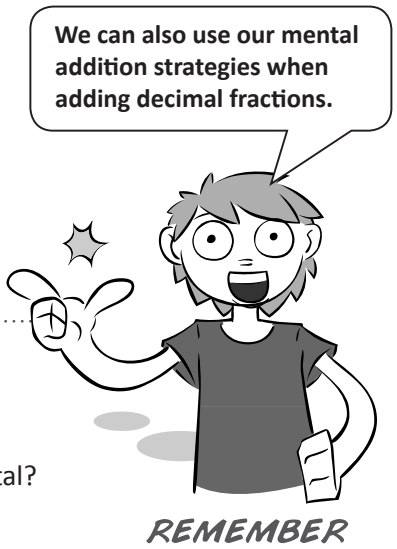
4 **Use a mental or written strategy of your choice to solve these problems:**

a Add 6.06 and 5.42

$$\begin{array}{r} 6.06 \\ +\ 5.42 \\ \hline 11.48 \end{array}$$

b Add 12.24 and 67.12

$$\begin{array}{r} 12.24 \\ +\ 67.12 \\ \hline 79.36 \end{array}$$



c Jack scored 7.25 for his first dive and 8.35 for his second. What was his total score?

$$\begin{array}{r} 7.25 \\ +\ 8.35 \\ \hline 15.60 \end{array}$$

d Kate bought a movie ticket costing $9.50 and a drink/popcorn combo costing $4.95. How much did she spend in total?

$$\begin{array}{r} \$\ 9.50 \\ +\ \$\ 4.95 \\ \hline \$\ 14.45 \end{array}$$

5 **This is a sample of the menu at Laura's Lunches.**

a Brad orders a souvlaki, a bucket of hot chips and an orange juice. How much will this cost him?

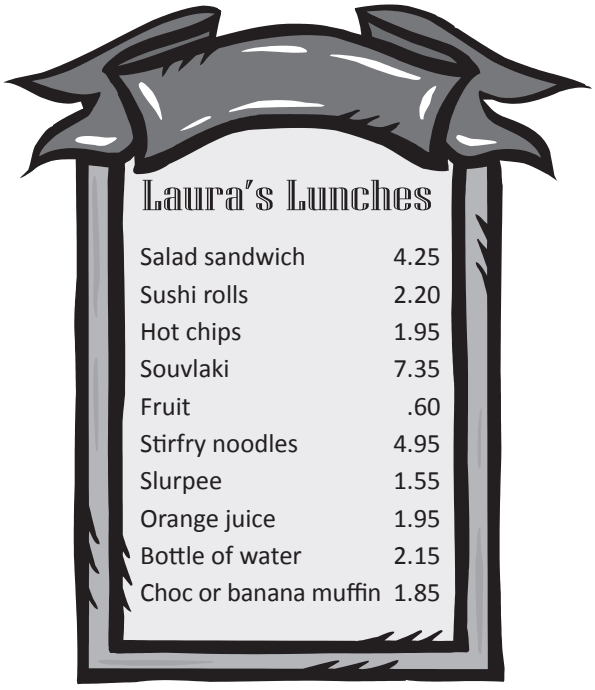
$11.25

b Angelina goes wild and orders a sushi roll, a bottle of water and a piece of fruit. What will this cost her?

$4.95

c Choose your own lunch. Itemise your list and calculate the total value of your order.

Answers will vary.



Calculating – subtracting decimal fractions

How do we subtract decimal fractions using a written strategy?

We arrange the numbers so the place values line up and then we start with the smallest value.

We first subtract the tenths. We have 2 tenths, can we subtract 5 tenths from this?

No, so we rename a unit as 10 tenths. Now we have 12 tenths. 12 tenths subtract 5 tenths is 7 tenths.

We have 5 units, can we subtract 4 units? Yes, the answer is 1 unit.

$$\begin{array}{r} {}^{5}\not{6}\,.\,{}^{1}2 \\ -\ 4\,.\,5 \\ \hline 1\,.\,7 \end{array}$$

1 **Solve these subtraction problems:**

a
$$\begin{array}{r} 8\,.\,3 \\ -\ 2\,.\,2 \\ \hline 6\,.\,1 \end{array}$$

b
$$\begin{array}{r} 4\,.\,7 \\ -\ 3\,.\,4 \\ \hline 1\,.\,3 \end{array}$$

c
$$\begin{array}{r} {}^{4}\not{5}\,.\,{}^{1}4 \\ -\ 3\,.\,5 \\ \hline 1\,.\,9 \end{array}$$

d
$$\begin{array}{r} 12\,.\,3 \\ -\ 5\,.\,2 \\ \hline 7\,.\,1 \end{array}$$

e
$$\begin{array}{r} 18\,.\,6 \\ -\ 11\,.\,2 \\ \hline 7\,.\,4 \end{array}$$

f
$$\begin{array}{r} {}^{8}\not{9}\,.\,{}^{1}4 \\ -\ 3\,.\,7 \\ \hline 5\,.\,7 \end{array}$$

2 **Now try these. Start with the hundredths and remember to rename if neccessary:**

a
$$\begin{array}{r} 8\,.\,4\,4 \\ -\ 3\,.\,2\,4 \\ \hline 5\,.\,2\,0 \end{array}$$

b
$$\begin{array}{r} 4\,.\,{}^{6}\not{7}\,{}^{1}2 \\ -\ 2\,.\,2\,9 \\ \hline 2\,.\,4\,3 \end{array}$$

c
$$\begin{array}{r} {}^{7}\not{8}\,.\,{}^{1}4\,6 \\ -\ 1\,.\,6\,3 \\ \hline 6\,.\,8\,3 \end{array}$$

Sometimes we have to work with numbers that have a different amount of digits such as **8.4 – 5.35** When this happens, we rename. 4 tenths becomes 40 hundredths: **8.40 – 5.35**

3 **Rename these problems and solve:**

a
$$\begin{array}{r} 9\,.\,{}^{4}\not{5}\,{}^{1}0 \\ -\ 2\,.\,2\,4 \\ \hline 7\,.\,2\,6 \end{array}$$

b
$$\begin{array}{r} {}^{5}\not{6}\,.\,{}^{1}1\,7 \\ -\ 2\,.\,3\,0 \\ \hline 3\,.\,8\,7 \end{array}$$

c
$$\begin{array}{r} {}^{8}\not{9}\,.\,{}^{12}\not{3}\,{}^{1}0 \\ -\ 4\,.\,7\,2 \\ \hline 4\,.\,5\,8 \end{array}$$

Calculating – subtracting decimal fractions

We can also use our mental strategies when subtracting decimal fractions.

4 **Use a mental or written strategy of your choice to solve these problems:**

a 27.47 – 16.27

11.2

b 13.75 – 9.25

4.5

c In 1936 Jesse Owens broke the long jump record with a leap of 2.06 m. His record stood for 25 years until fellow American, Ralph Boston leapt 2.21 m. What did he beat Jesse's record by?

0.15 m

d The 100 m sprint record is held by Jamaican Usain Bolt, with a time of 9.69 sec. Asafa Powell neared that record a month later, with a time of 9.7 sec. What is the difference between their times? How much do you think Powell wishes he had managed to go just a tad faster?

0.01 sec

5 **Belle's netball team measured their heights and entered them on the chart. What is the difference in heights between:**

Belle's Beauties

Suzy	1.43 m
Ti	1.37 m
Grace	1.47 m
Marietta	1.42 m
Madison	1.54 m
Lucy	1.58 m
Belle	1.61 m
Natasha	1.53 m
Donna	1.34 m
Nina	1.53 m

a Suzy and Lucy?

0.15 m

b Ti and Natasha?

0.16 m

c Nina and Belle?

0.08 m

d The tallest and shortest girl?

0.27 m

You cut, I choose

solve

Getting ready

You and your friend have been asked to attend a tea party. Your host, Mr Hatter, has made a chocolate clock cake for the festivities, but clearly he got a little mixed up with his numbers. It must have been all those pre-party nerves, or quite possibly the punch.

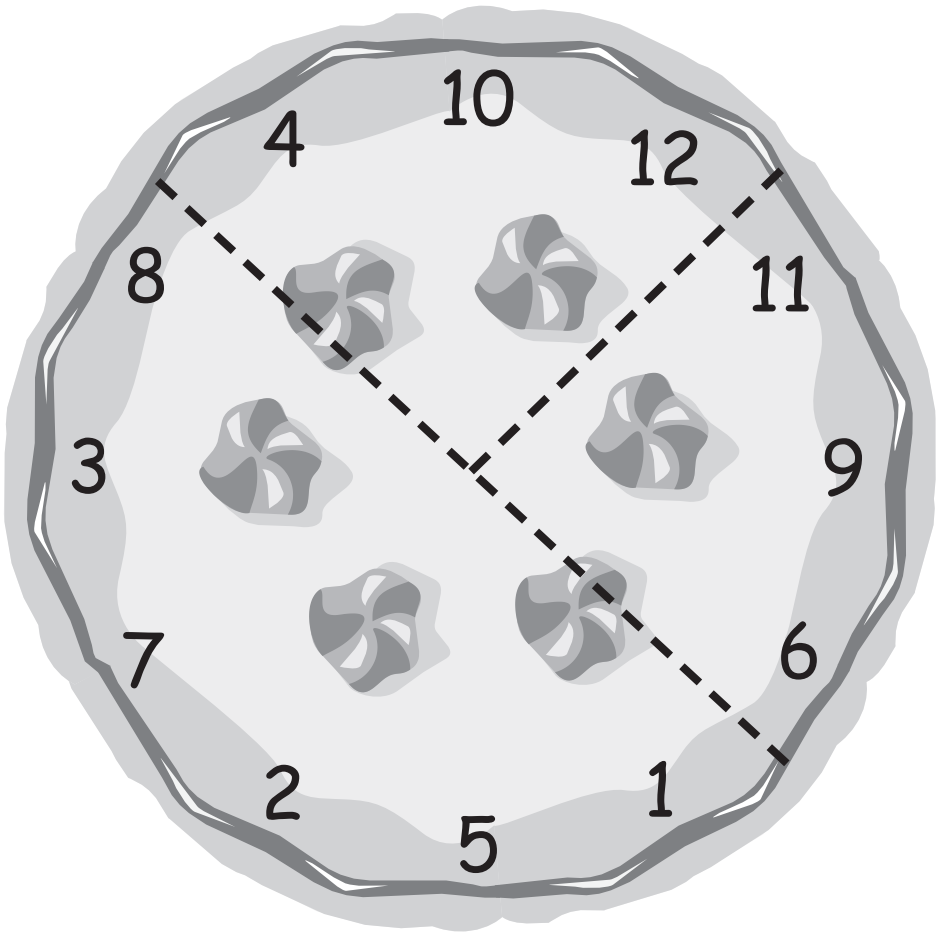
What to do

Anyway, he has asked you to cut the cake into 3 pieces so that each of you gets a piece with the numbers adding to the same total. How do you do it? Show your cuts on the clock cake below.

Each piece totals ___26___

Work out what fraction of the cake each of you receive. I should warn you, Mr Hatter wants the biggest piece.

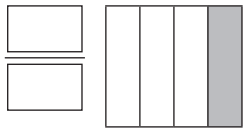
I receive $\frac{1}{4}$ my friend receives $\frac{1}{4}$ and Mr Hatter receives $\frac{1}{2}$

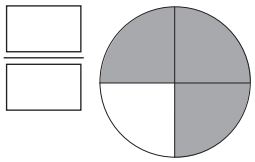


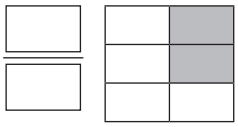
Fractions

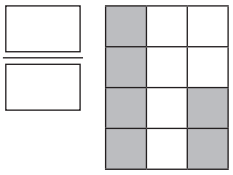
Name _____

1 **What fraction of each shape is shaded?**

a 

b 

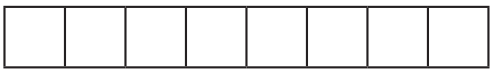
c 

d 

2 **Shade the following to show:**

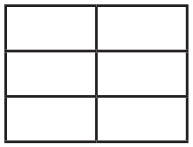
a 

$\frac{2}{4}$

b 

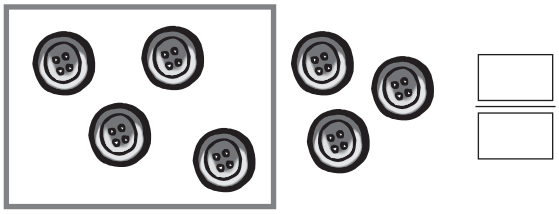
$\frac{6}{8}$

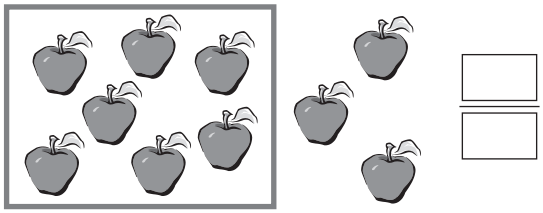
c  $\frac{4}{5}$

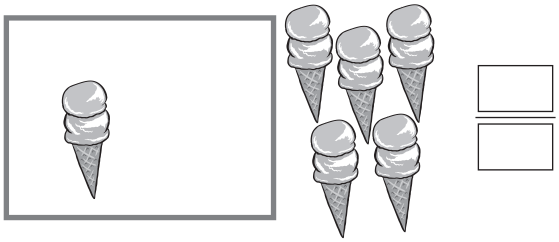
d  $\frac{3}{6}$

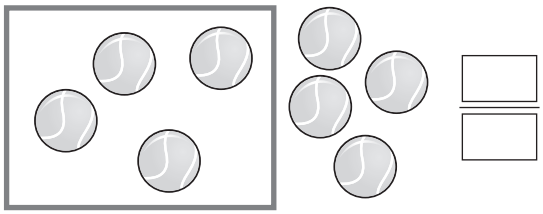
e  $\frac{2}{3}$

3 **What fraction of each group is outside the box?**

a 

c 

b 

d 

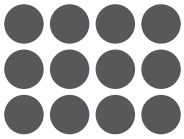
4 **What is:**

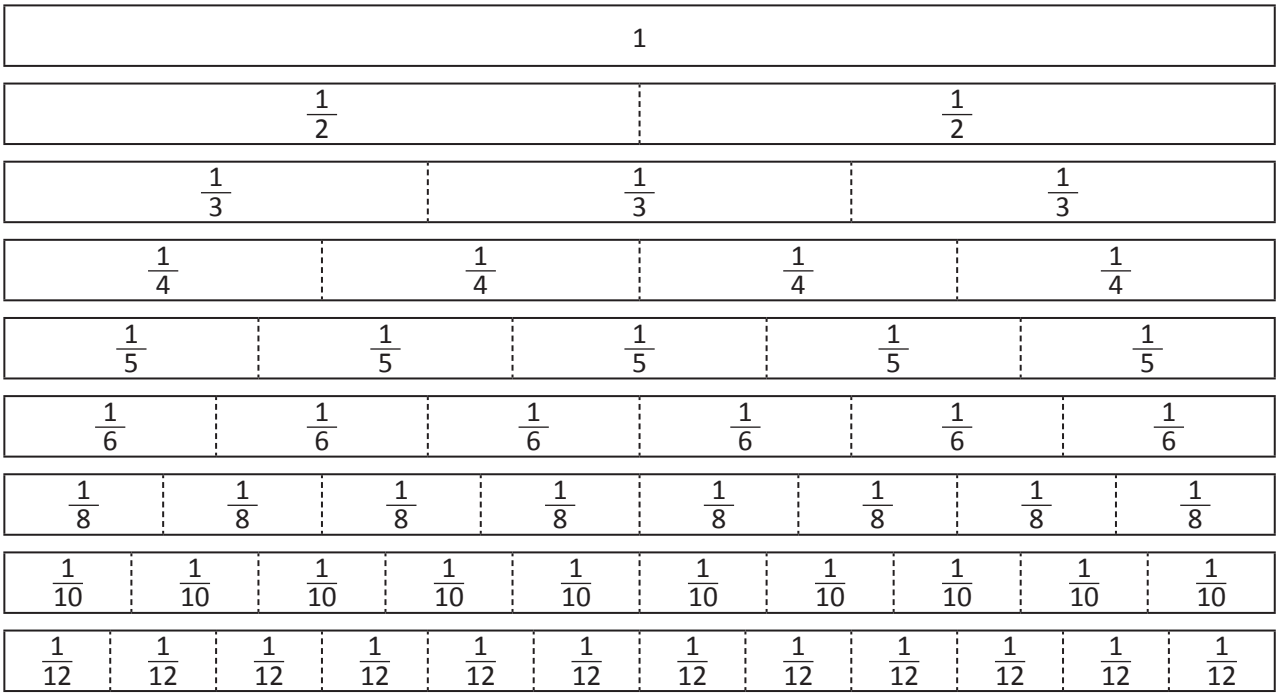
a $\frac{1}{4}$ of 12 = ☐

b $\frac{1}{3}$ of 12 = ☐

c $\frac{1}{2}$ of 12 = ☐

d $\frac{2}{3}$ of 12 = ☐





5 **Use the fraction strips above to help answer the following:**

a Circle the larger fraction $\frac{3}{4}$ $\frac{4}{8}$

b Circle the larger fraction $\frac{5}{6}$ $\frac{5}{10}$

c Circle the smaller fraction $\frac{2}{3}$ $\frac{2}{8}$

d Circle the smaller fraction $\frac{1}{2}$ $\frac{3}{12}$

e Put these fractions in order from smallest to largest:

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

6 **Are these statements true or false?**

a $\frac{3}{4}$ is less than $\frac{1}{2}$ ____

b $\frac{5}{10}$ is the same as $\frac{1}{2}$ ____

c $\frac{7}{12}$ is less than $\frac{6}{10}$ ____

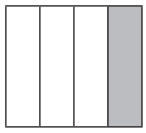
d $\frac{2}{3}$ is the same as $\frac{6}{10}$ ____

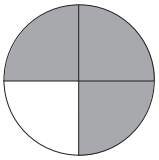
Skills	Not yet	Kind of	Got it
• Recognises, names and models common fractions of shapes			
• Recognises, names and models common fractions of collections			
• Compares and orders common fractions using visual aids			

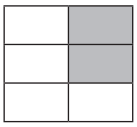
Fractions

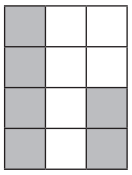
Name _____

1 **What fraction of each shape is shaded?**

a $\frac{1}{4}$ 

b $\frac{3}{4}$ 

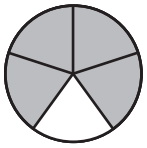
c $\frac{2}{6}$ 

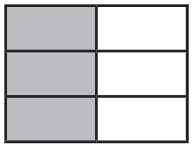
d $\frac{6}{12}$ 

2 **Shade the following to show:** *Shadings will vary.*

a 
$\frac{2}{4}$

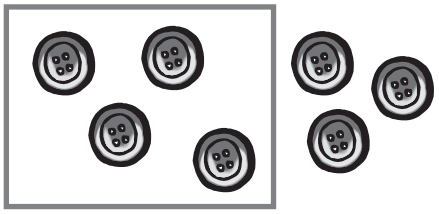
b 
$\frac{6}{8}$

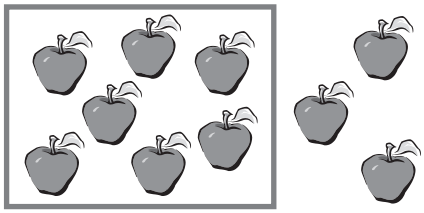
c  $\frac{4}{5}$

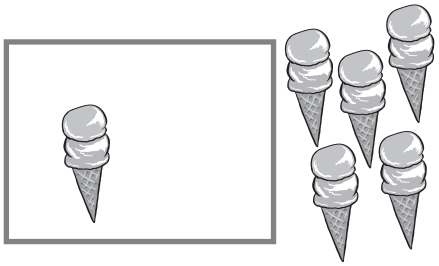
d  $\frac{3}{6}$

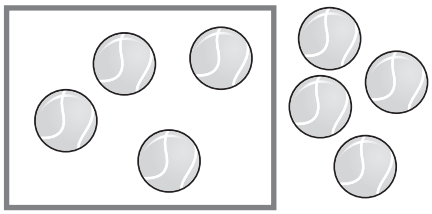
e  $\frac{2}{3}$

3 **What fraction of each group is outside the box?**

a  $\frac{3}{7}$

c  $\frac{3}{10}$

b  $\frac{5}{6}$

d  $\frac{4}{8}$ or $\frac{1}{2}$

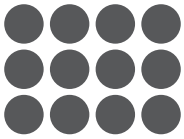
4 **What is:**

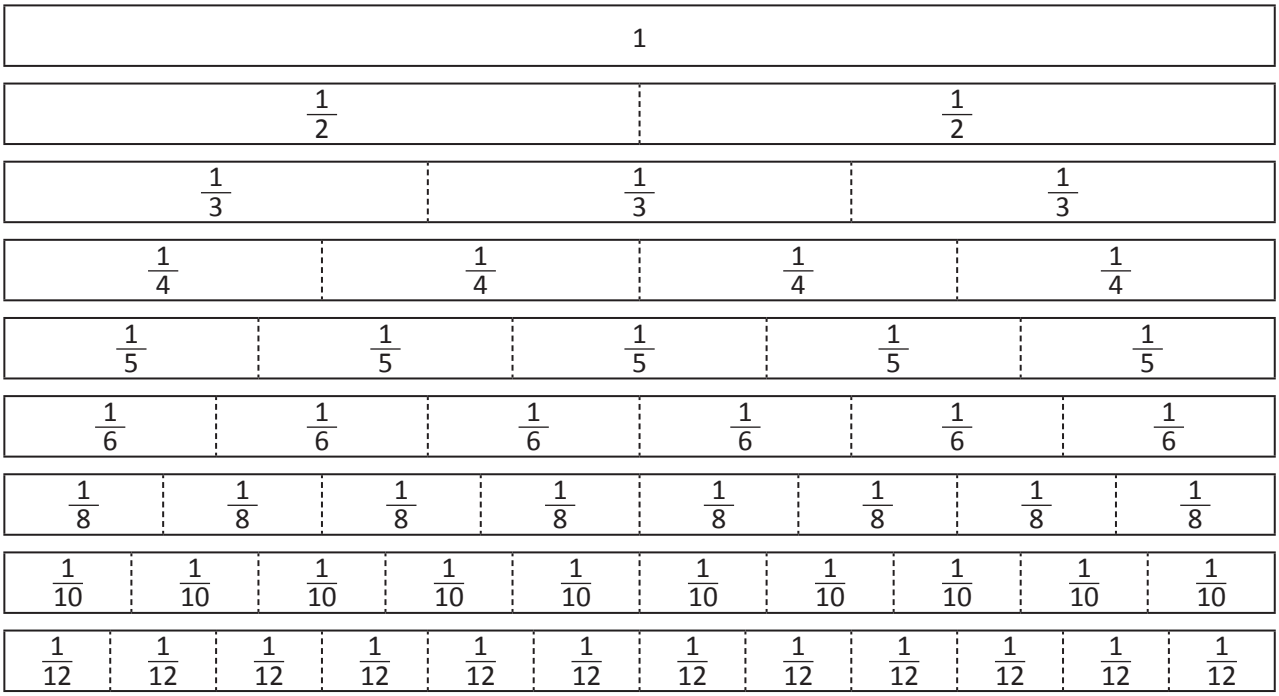
a $\frac{1}{4}$ of 12 = 3

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

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

d $\frac{2}{3}$ of 12 = 8





5 **Use the fraction strips above to help answer the following:**

a Circle the larger fraction (3/4) 4/8

b Circle the larger fraction (5/6) 5/10

c Circle the smaller fraction 2/3 (2/8)

d Circle the smaller fraction 1/2 (3/12)

e Put these fractions in order from smallest to largest:

1/6 9/12 1/4 1/2 1/3

1/6 1/4 1/3 1/2 9/12

6 **Are these statements true or false?**

a 3/4 is less than 1/2 — False

b 5/10 is the same as 1/2 — True

c 7/12 is less than 6/10 — True

d 2/3 is the same as 6/10 — False

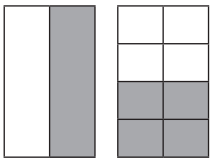
Skills	Not yet	Kind of	Got it
• Recognises, names and models common fractions of shapes			
• Recognises, names and models common fractions of collections			
• Compares and orders common fractions using visual aids			

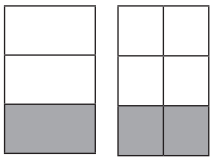
Types of fractions

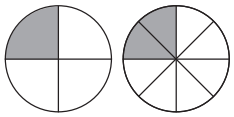
Name _____

1 **What are equivalent fractions? Explain using the fractions $\frac{1}{2}$ and $\frac{2}{4}$. You may also draw diagrams:**

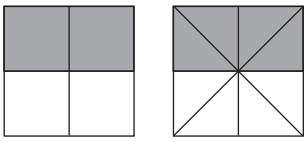
2 **Write the equivalent fraction for each of these:**

a  $\frac{1}{2} = \frac{\square}{8}$

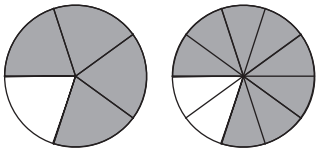
b  $\frac{1}{3} = \frac{\square}{6}$

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

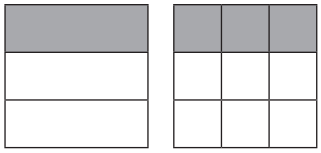
3 **These problems have been answered. Tick the ones that have been answered correctly:**

a 

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

b 

$\frac{4}{5} = \frac{8}{5}$

c 

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

$\frac{1}{2}$				$\frac{1}{2}$			
$\frac{1}{3}$			$\frac{1}{3}$			$\frac{1}{3}$	
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{6}$	$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

4 **Use the fractions strips above to help you answer the following. Write true or false for each question:**

a $\frac{1}{2}$ is equivalent to $\frac{3}{6}$ ..... ( )

b $\frac{2}{4}$ is equivalent to $\frac{1}{3}$ ..... ( )

c $\frac{2}{8}$ is equivalent to $\frac{2}{6}$ ..... ( )

d $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ ..... ( )

Types of fractions

Name _____

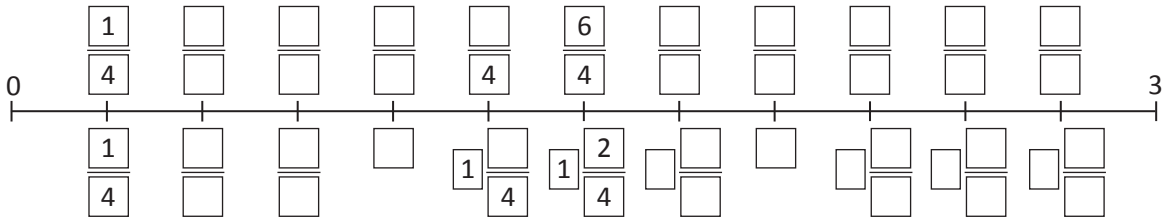
5 **Answer true or false to the following:**

a $1\frac{1}{2}$ is a mixed number .....

b $2\frac{3}{4}$ is an improper fraction .....

c $\frac{11}{4}$ is an improper fraction .....

6 **Complete the number lines by filling in the boxes. The mixed numerals go on the bottom and the improper fractions go on the top:**



7 **Use the number line in Question 6 to help you answer the following:**

a Write the mixed numeral that represents $\frac{6}{4}$

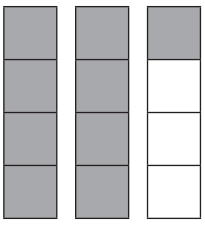
b Write the improper fraction that represents $1\frac{1}{4}$

c Write the mixed numeral that represents $\frac{11}{4}$

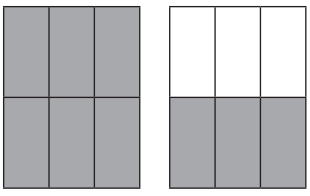
d Write the improper fraction that represents $1\frac{2}{4}$

8 **Express these fractions as a mixed numeral and as an improper fraction:**

a



b



Skills	Not yet	Kind of	Got it
• Recognises, names and models simple equivalent fractions			
• Recognises, names and models mixed numerals and improper fractions			
• Uses diagrams, fraction strips and number lines to represent fractions			

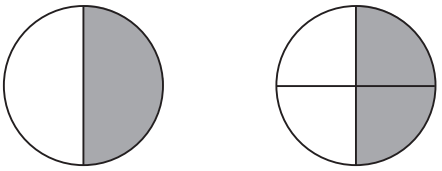
Types of fractions

Name _____

1 **What are equivalent fractions? Explain using the fractions $\frac{1}{2}$ and $\frac{2}{4}$. You may also draw diagrams:**

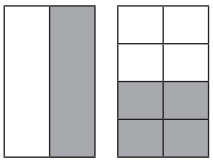
Answers will vary.

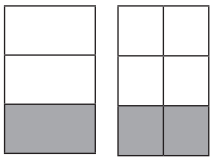
Equivalent fractions are the same. Look at:

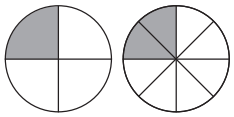


They are the same amount.

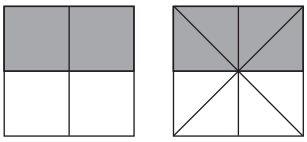
2 **Write the equivalent fraction for each of these:**

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

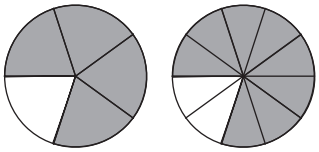
b  $\frac{1}{3} = \frac{2}{6}$

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

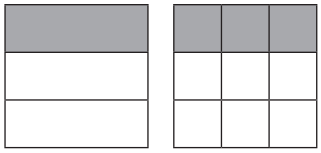
3 **These problems have been answered. Tick the ones that have been answered correctly:**

a 

$\frac{2}{4} = \frac{4}{8}$ ✓

b 

$\frac{4}{5} = \frac{8}{5}$ ✗

c 

$\frac{1}{3} = \frac{3}{6}$ ✗

$\frac{1}{2}$				$\frac{1}{2}$			
$\frac{1}{3}$			$\frac{1}{3}$			$\frac{1}{3}$	
$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$		$\frac{1}{4}$	
$\frac{1}{6}$	$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$
$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$

4 **Use the fractions strips above to help you answer the following. Write true or false for each question:**

a $\frac{1}{2}$ is equivalent to $\frac{3}{6}$ ..... *True*

b $\frac{2}{4}$ is equivalent to $\frac{1}{3}$ ..... *False*

c $\frac{2}{8}$ is equivalent to $\frac{2}{6}$ ..... *False*

d $\frac{3}{4}$ is equivalent to $\frac{6}{8}$ ..... *True*

Types of fractions

Name _____

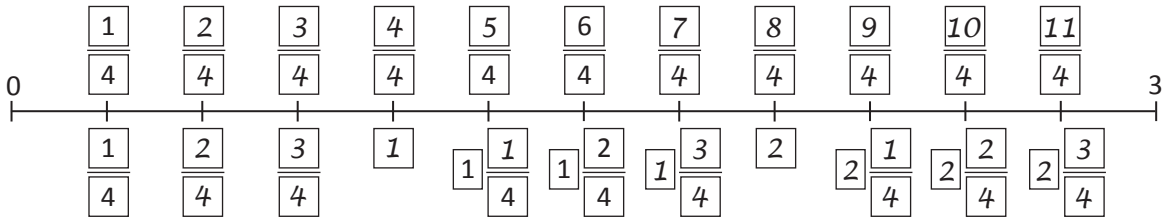
5 **Answer true or false to the following:**

a $1\frac{1}{2}$ is a mixed number ..... True

b $2\frac{3}{4}$ is an improper fraction ..... False

c $\frac{11}{4}$ is an improper fraction ..... True

6 **Complete the number lines by filling in the boxes. The mixed numerals go on the bottom and the improper fractions go on the top:**



7 **Use the number line in Question 6 to help you answer the following:**

a Write the mixed numeral that represents $\frac{6}{4}$ $1\frac{2}{4}$

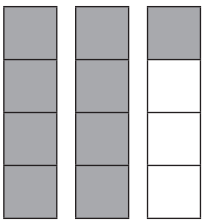
b Write the improper fraction that represents $1\frac{1}{4}$ $\frac{5}{4}$

c Write the mixed numeral that represents $\frac{11}{4}$ $2\frac{3}{4}$

d Write the improper fraction that represents $1\frac{2}{4}$ $\frac{6}{4}$

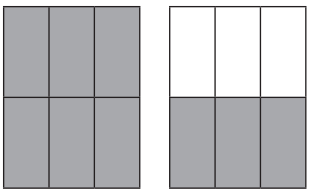
8 **Express these fractions as a mixed numeral and as an improper fraction:**

a



$2\frac{1}{4}$ $\frac{9}{4}$

b



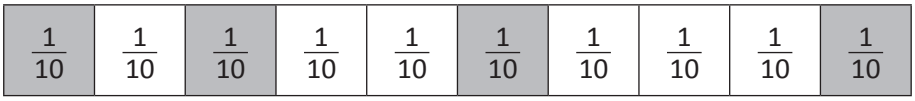
$1\frac{3}{6}$ or $1\frac{1}{2}$ $\frac{9}{6}$

Skills	Not yet	Kind of	Got it
• Recognises, names and models simple equivalent fractions			
• Recognises, names and models mixed numerals and improper fractions			
• Uses diagrams, fraction strips and number lines to represent fractions			

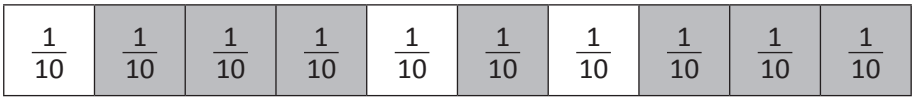
Fractions, decimals and percentages Name _____

1 **Expresss the shaded amounts as both fractions and decimals:**

a



b



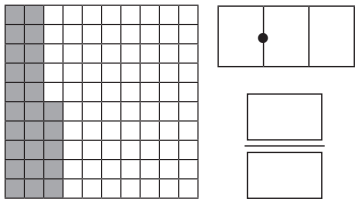
2 **Shade the fraction strips to match the fraction or decimal:**

a 0.8

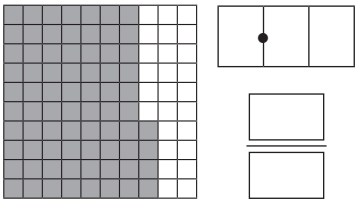
b $\frac{5}{10}$

3 **Express these amounts as both fractions and decimals:**

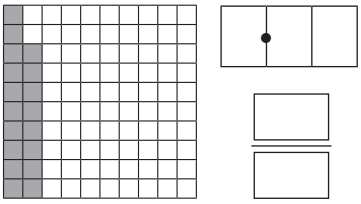
a



b

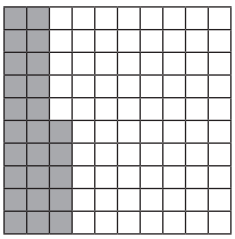


c



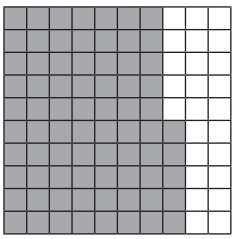
4 **Circle the true statements:**

a



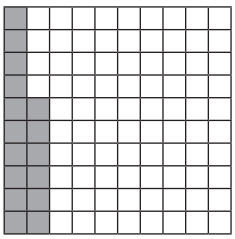
This is twenty-five hundredths. It can also be named as two tenths and five hundredths.

b



This is seventy-five hundredths. It can also be named as seven tenths and five hundredths.

c



This is sixteen hundredths. This is written as 1.6.

5 **Circle the larger number in each pair:**

a 0.8 0.08

b 0.56 6 tenths

c 6.0 $\frac{6}{10}$

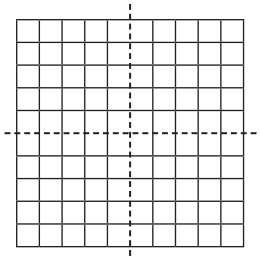
d 1.4 0.14

6 **Write these numbers in the place value chart:**

	Thousands	Hundreds	Tens	Units	Tenths	Hundredths	Thousandths
a 4 tens, 3 units and 7 tenths							
b 8 hundreds, 9 tens, 3 units, 5 tenths and 3 hundredths							
c nine units, seven tenths and three thousandths							
d 8 hundreds, 6 tenths, 4 hundredths and 2 thousandths			0	0			
e five units, two tenths and eight hundredths							

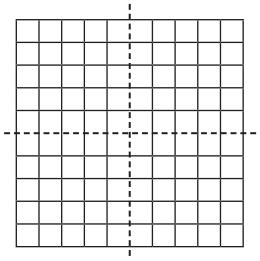
7 **Shade the following fractions and fill in the missing information:**

a



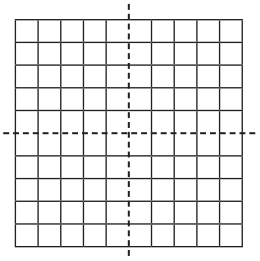
$\frac{1}{4}$	0.	%

b



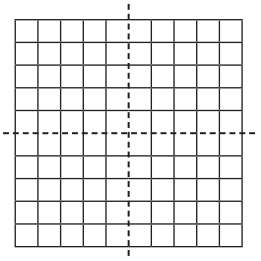
$\frac{1}{2}$	0.	%

c



$\frac{3}{4}$	0.	%

d



$\frac{4}{4}$	.	%

8 **Answer the following:**

a A sale offers 25% off an item costing $100. What is the price reduction? .....

b A sale offers 50% off an item costing $50. How much does the item now cost? .....

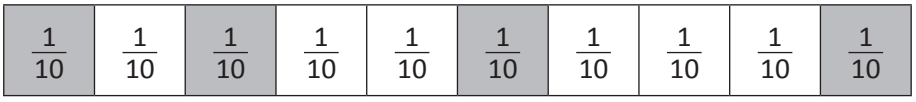
c What is 10% of 100?.....

Skills	Not yet	Kind of	Got it
• Recognises, names and models tenths			
• Recognises, names and models hundredths			
• Compares and orders decimals to 3 decimal places			
• Links simple common fractions with decimals and percentages			
• Calculates simple percentages – 10%, 25% and 50%			

Fractions, decimals and percentages Name _____

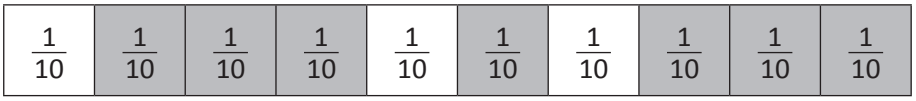
1 **Expresss the shaded amounts as both fractions and decimals:**

a



$\frac{4}{10}$ 0.4

b



$\frac{7}{10}$ 0.7

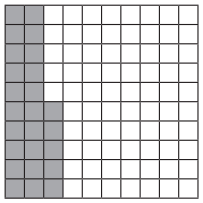
2 **Shade the fraction strips to match the fraction or decimal:**

a 0.8

b $\frac{5}{10}$

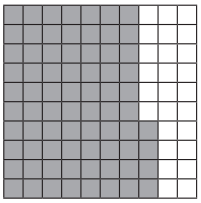
3 **Express these amounts as both fractions and decimals:**

a



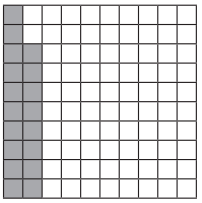
0.25 $\frac{25}{100}$ or $\frac{1}{4}$

b



0.74 $\frac{74}{100}$

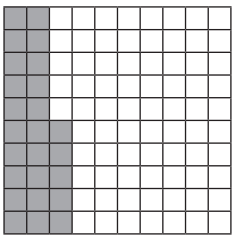
c



0.18 $\frac{18}{100}$

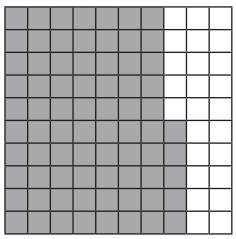
4 **Circle the true statements:**

a



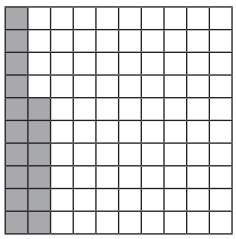
This is twenty-five hundredths. It can also be named as two tenths and five hundredths.

b



This is seventy-five hundredths. It can also be named as seven tenths and five hundredths.

c



This is sixteen hundredths. This is written as 1.6.

5 **Circle the larger number in each pair:**

a (0.8) 0.08

b 0.56 (6 tenths)

c (6.0) $\frac{6}{10}$

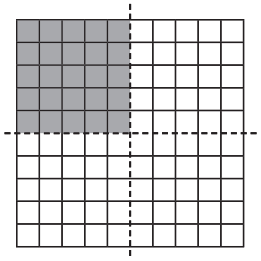
d (1.4) 0.14

6 **Write these numbers in the place value chart:**

	Thousands	Hundreds	Tens	Units	Tenths	Hundredths	Thousandths
a 4 tens, 3 units and 7 tenths			*4*	*3* • *7*			
b 8 hundreds, 9 tens, 3 units, 5 tenths and 3 hundredths		*8*	*9*	*3* • *5*		*3*	
c nine units, seven tenths and three thousandths				*9* • *7*		*0*	*3*
d 8 hundreds, 6 tenths, 4 hundredths and 2 thousandths		*8*	0	0 • *6*		*4*	*2*
e five units, two tenths and eight hundredths				*5* • *2*		*8*	

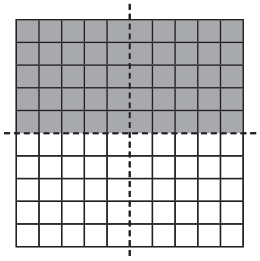
7 **Shade the following fractions and fill in the missing information:**

a



$\frac{1}{4}$	*0.25*	*25%*

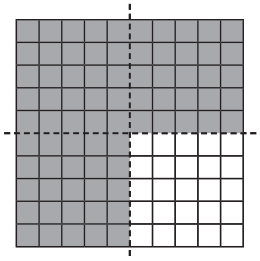
b



$\frac{1}{2}$	*0.50*	*50%*

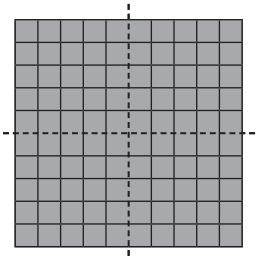
or
0.5

c



$\frac{3}{4}$	*0.75*	*75%*

d



$\frac{4}{4}$	*1.0*	*100%*

or
1

8 **Answer the following:**

a A sale offers 25% off an item costing $100. What is the price reduction? *$25*

b A sale offers 50% off an item costing $50. How much does the item now cost? *$25*

c What is 10% of 100? *$10*

Skills	Not yet	Kind of	Got it
• Recognises, names and models tenths			
• Recognises, names and models hundredths			
• Compares and orders decimals to 3 decimal places			
• Links simple common fractions with decimals and percentages			
• Calculates simple percentages – 10%, 25% and 50%			

Calculating

Name _____

1 **Add these fractions:**

a $\frac{1}{4} + \frac{2}{4} = \frac{\square}{\square}$

b $\frac{2}{8} + \frac{3}{8} = \frac{\square}{\square}$

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

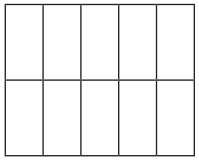
d $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{\square}{\square}$

e $\frac{1}{9} + \frac{2}{9} + \frac{4}{9} = \frac{\square}{\square}$

f $\frac{1}{8} + \frac{5}{8} + \frac{4}{8} = \frac{\square}{\square}$

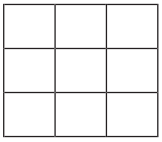
2 **Use the shapes to help you solve these subtraction problems:**

a



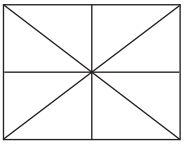
$\frac{10}{10} - \frac{6}{10} = \frac{\square}{\square}$

b



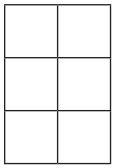
$\frac{9}{9} - \frac{2}{9} = \frac{\square}{\square}$

c



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

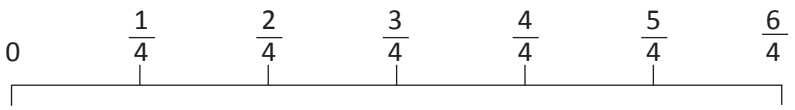
d



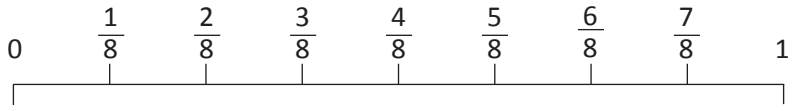
$\frac{6}{6} - \frac{5}{6} = \frac{\square}{\square}$

3 **Use the number lines to help you work out the answers to these problems:**

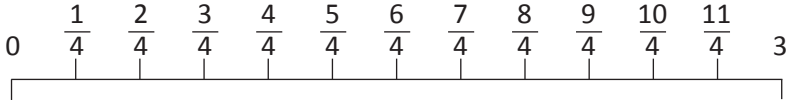
a $\frac{2}{4} + \frac{1}{4} = \frac{\square}{\square}$



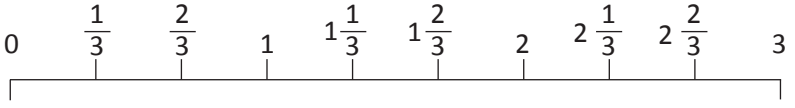
b $\frac{6}{8} - \frac{3}{8} = \frac{\square}{\square}$



c $\frac{11}{4} - \frac{5}{4} = \frac{\square}{\square}$



d $2\frac{1}{3} - \frac{2}{3} = \square \frac{\square}{\square}$



4 **What is $2 - \frac{1}{3}$? Use fractions and words or diagrams to explain your answer:**

5 **Add these decimal fractions:**

a 3.6 + 2.1 = _____

b 4.7 + 4.4 = _____

c 8.4 + 3.8 = _____

d 5.12 + 1.23 = _____

e 3.86 + 7.15 = _____

f 9.48 + 3.7 = _____

6 **Solve these subtraction problems:**

a 7.3 − 4.2 = _____

b 53.7 − 13.3 = _____

c 29.2 − 23.4 = _____

d 7.34 − 3.27 = _____

e 6.52 − 3.29 = _____

f 8.4 − 1.63 = _____

7 **Solve these problems using a mental or written strategy:**

a Mariska has $7.55 in her piggy bank. She spends $2.65 of this. How much money does she have left?

b Joe has $4.95. His gran gives him $15.25 for mowing the lawns. How much money does he have now?

Skills	Not yet	Kind of	Got it
• Adds fractions with like denominators			
• Subtracts fractions with like denominators			
• Subtracts a unit fraction from a whole number			
• Adds decimal numbers to 2 decimal places with renaming			
• Subtracts decimal numbers to 2 decimal places with renaming			

Calculating

Name _____

1 **Add these fractions:**

a $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

b $\frac{2}{8} + \frac{3}{8} = \frac{5}{8}$

c $\frac{1}{5} + \frac{3}{5} = \frac{4}{5}$

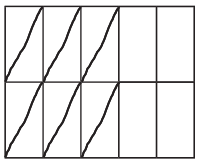
d $\frac{1}{5} + \frac{1}{5} + \frac{1}{5} = \frac{3}{5}$

e $\frac{1}{9} + \frac{2}{9} + \frac{4}{9} = \frac{7}{9}$

f $\frac{1}{8} + \frac{5}{8} + \frac{4}{8} = \frac{10}{8}$

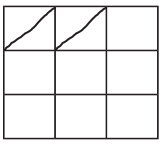
2 **Use the shapes to help you solve these subtraction problems:**

a



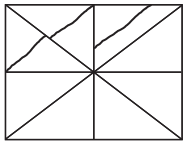
$\frac{10}{10} - \frac{6}{10} = \frac{4}{10}$

b



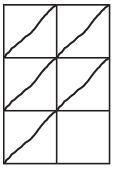
$\frac{9}{9} - \frac{2}{9} = \frac{7}{9}$

c



$\frac{8}{8} - \frac{3}{8} = \frac{5}{8}$

d



$\frac{6}{6} - \frac{5}{6} = \frac{1}{6}$

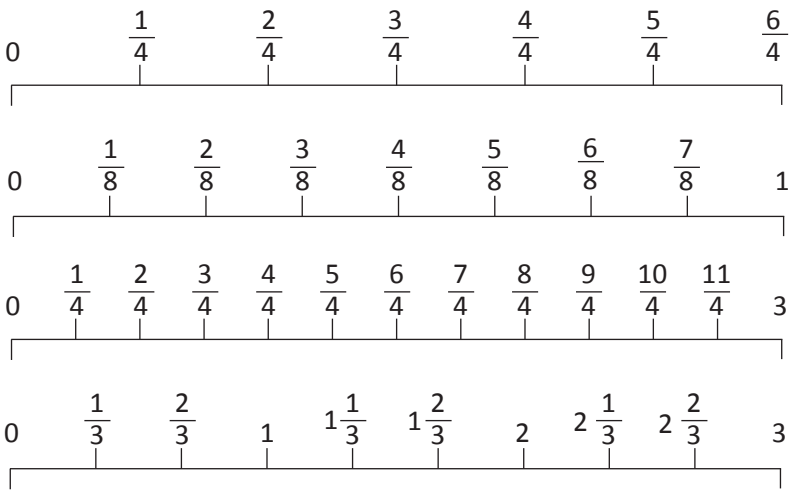
3 **Use the number lines to help you work out the answers to these problems:**

a $\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$

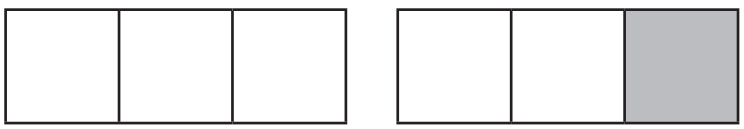
b $\frac{6}{8} - \frac{3}{8} = \frac{3}{8}$

c $\frac{11}{4} - \frac{5}{4} = \frac{6}{4}$

d $2\frac{1}{3} - \frac{2}{3} = 1\frac{2}{3}$



4 **What is $2 - \frac{1}{3}$? Use fractions and words or diagrams to explain your answer:**



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

or

$\frac{6}{3} - \frac{1}{3} = \frac{5}{3}$

5 **Add these decimal fractions:**

a
$$\begin{array}{r} 3.6 \\ +\ 2.1 \\ \hline 5.7 \end{array}$$

b
$$\begin{array}{r} {}^{1}4.7 \\ +\ 4.4 \\ \hline 9.1 \end{array}$$

c
$$\begin{array}{r} {}^{1}8.4 \\ +\ 3.8 \\ \hline 12.2 \end{array}$$

d
$$\begin{array}{r} 5.12 \\ +\ 1.23 \\ \hline 6.35 \end{array}$$

e
$$\begin{array}{r} {}^{1}3.{}^{1}86 \\ +\ 7.15 \\ \hline 11.01 \end{array}$$

f
$$\begin{array}{r} {}^{1}9.48 \\ +\ 3.70 \\ \hline 13.18 \end{array}$$

6 **Solve these subtraction problems:**

a
$$\begin{array}{r} 7.3 \\ -\ 4.2 \\ \hline 3.1 \end{array}$$

b
$$\begin{array}{r} 53.7 \\ -\ 13.3 \\ \hline 40.4 \end{array}$$

c
$$\begin{array}{r} 2\,{}^{8}\cancel{9}.{}^{1}2 \\ -\ 23.4 \\ \hline 5.8 \end{array}$$

d
$$\begin{array}{r} 7.{}^{2}\cancel{3}\,{}^{1}4 \\ -\ 3.27 \\ \hline 4.07 \end{array}$$

e
$$\begin{array}{r} 6.{}^{4}\cancel{5}\,{}^{1}2 \\ -\ 3.29 \\ \hline 3.23 \end{array}$$

f
$$\begin{array}{r} {}^{7}\cancel{8}.{}^{13}\cancel{4}\,{}^{1}0 \\ -\ 1.63 \\ \hline 6.77 \end{array}$$

7 **Solve these problems using a mental or written strategy:** *Strategies will vary.*

a Mariska has $7.55 in her piggy bank. She spends $2.65 of this. How much money does she have left?

$$\begin{array}{r} {}^{6}\cancel{7}.{}^{1}55 \\ -\ 2.65 \\ \hline \$4.90 \end{array}$$ *left*

b Joe has $4.95. His gran gives him $15.25 for mowing the lawns. How much money does he have now?

$$\begin{array}{r} {}^{1}4.{}^{1}95 \\ +\ {}^{1}15.25 \\ \hline \$20.20 \end{array}$$

Skills	Not yet	Kind of	Got it
• Adds fractions with like denominators			
• Subtracts fractions with like denominators			
• Subtracts a unit fraction from a whole number			
• Adds decimal numbers to 2 decimal places with renaming			
• Subtracts decimal numbers to 2 decimal places with renaming			

Series F – Fractions, Decimals and Percentages

Region	Topic 1 Fractions	Topic 2 Types of fractions	Topic 3 Fractions, decimals and %	Topic 4 Calculating
NSW	• model thirds, sixths and twelfths of a whole object or collection of objects • place thirds, sixths and twelfths on a numberline to establish equivalence	• express mixed numerals as improper fractions and vice versa through the use of diagrams, leading to a mental strategy	• express tenths and hundredths as decimals • compare and order decimals • place decimals on a number line	• recognise that $1 + \frac{1}{2} = 1\frac{1}{2}$ • use written, diagram and mental strategies to subtract a unit ftraction from any one whole number • add and subtract decimals with a different number of decimal places • explain or demonstrate why 2 fractions are not equivalent (WM) • use estimation to check if an answer is reasonable (WM)
VIC	**VELS Number – Level 4**			
	• use decimals, ratios and percentages to find equivalent representations of common fractions • add, subtract, and multiply fractions and decimals (to two decimal places) and apply these operations in practical contexts, including the use of money. • use estimates for computations and apply criteria to determine if estimates are reasonable or not			
QLD	**Level 4 – use simple and decimal fractions and a range of strategies to solve problems**			
	• place decimal fractions (to at least hundredths), common and mixed fractions on a number line • know that the place value of decimal fractions change when multiplied by 10 and 100 • represent common and mixed fractions as a collection of objects, on number lines and as parts of a measure • add and subtract with decimal fractions to hundredths • recognise and use simple equivalent fractions when solving problems			
SA	**3.6 Represent and analyse relationships amongst number concepts and uses these to make sense of, and represent the world** **3.7 Describe, represent and analyse operations with rational numbers and relationships between them**			
	• analyse and use fractions, decimals and common percentages to represent proportions of collections, measurements, sets of data and amounts of money • use materials, a four-function calculator and number lines to represent and apply the commutative and associative properties when adding or multiplying decimals or fractions • use patterns of base 10 to develop multiplication and division strategies with decimal fractions			

Series F – Fractions, Decimals and Percentages

Region	Topic 1 Fractions	Topic 2 Types of fractions	Topic 3 Fractions, decimals and %	Topic 4 Calculating
TAS	**Standards 3–4**			
	• understand common fractions in any context (as part of a collection, as area and linear models and as a part of whole object) • read and order common decimals • develop mental methods for working with decimals using similar approaches to those used for whole numbers • read, name, compare and locate common fractions on a number line • identify common equivalent fractions e.g. $\frac{3}{4} = \frac{9}{12}$ • order unit fractions to tenths e.g. understand that $\frac{1}{7}$ is smaller than $\frac{1}{4}$ and be able to explain and model why this is so			
WA/NT	**N 6a.4 Understand whole numbers and decimals** **N 6b.4 Understand fractions**			
	• interpret fractional quantities as relating to equal parts of a thing, quantity or collection of things • use models to represent decimals as numbers, such as on a 10 × 10 grid, and explain how they can be used to introduce key percentages and represent money or measures, referring to place value • place decimal numbers with an equal number of places, such as 0.2, 0.4, … on a number line and order them using the symbols <, = and > • rewrite the decimal part of a number as a fraction: for example, 0.35 is $\frac{35}{100}$ • read, write and say common fractions and have a sense of the relative magnitude and position on a number line of fractions that are visualised easily • state fractional equivalents in words and symbols			
ACT	**16.LC.4** operations of addition and subtraction using whole numbers to thousands and decimals to hundredths in familiar contexts **16.LC.6** inverse operations **16.LC.20** choose when to use mental computation, written or electronic methods to calculate with numbers and form quick mental estimates to check calculations. **16.LC.18** explain the calculation approaches they use, compare them with other approaches and check the reasonableness of their answers			