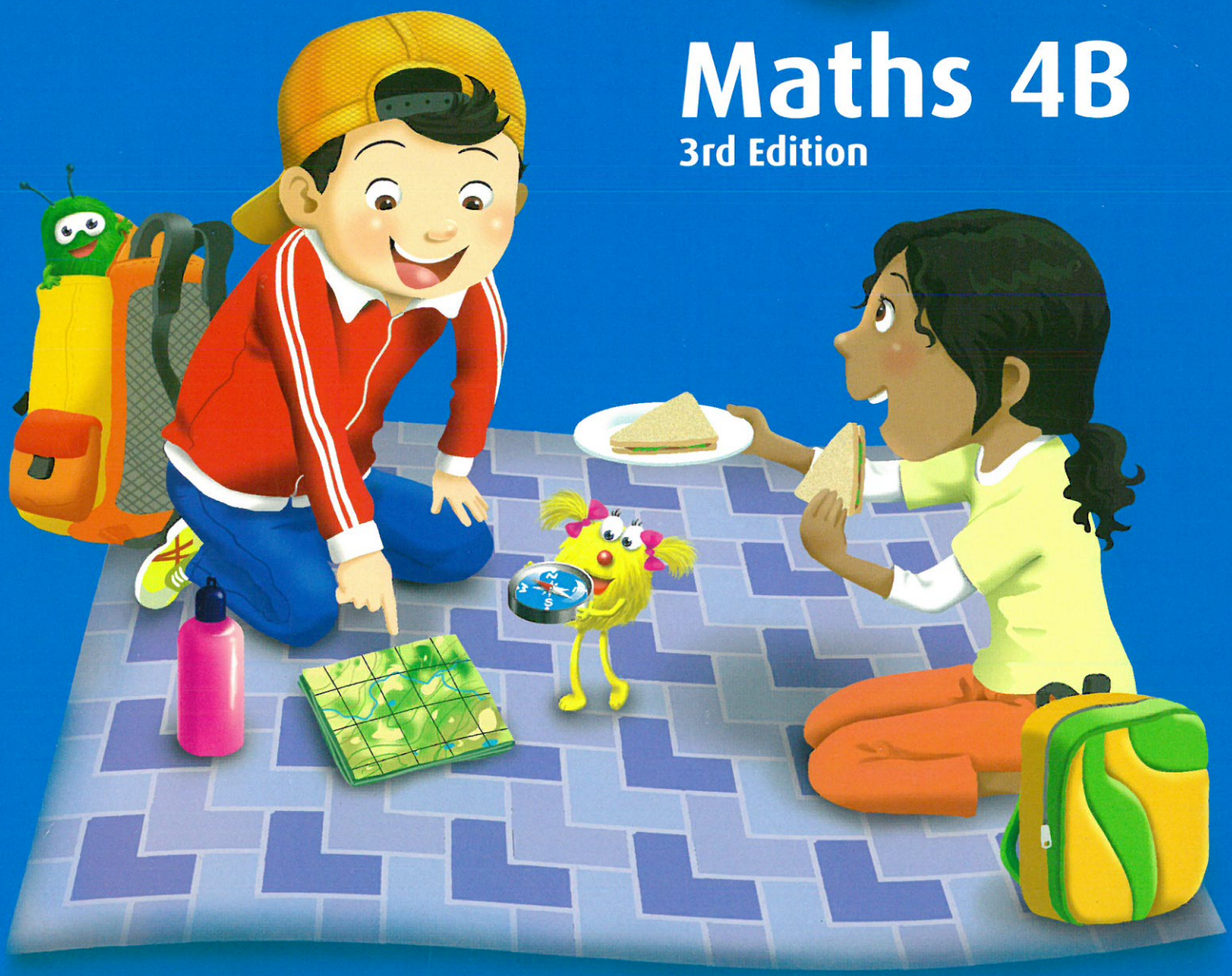
Marshall Cavendish Education

Pupil's Book

MY PALS ARE HERE!

Maths 4B

3rd Edition



Dr Fong Ho Kheong • Gan Kee Soon • Chelvi Ramakrishnan

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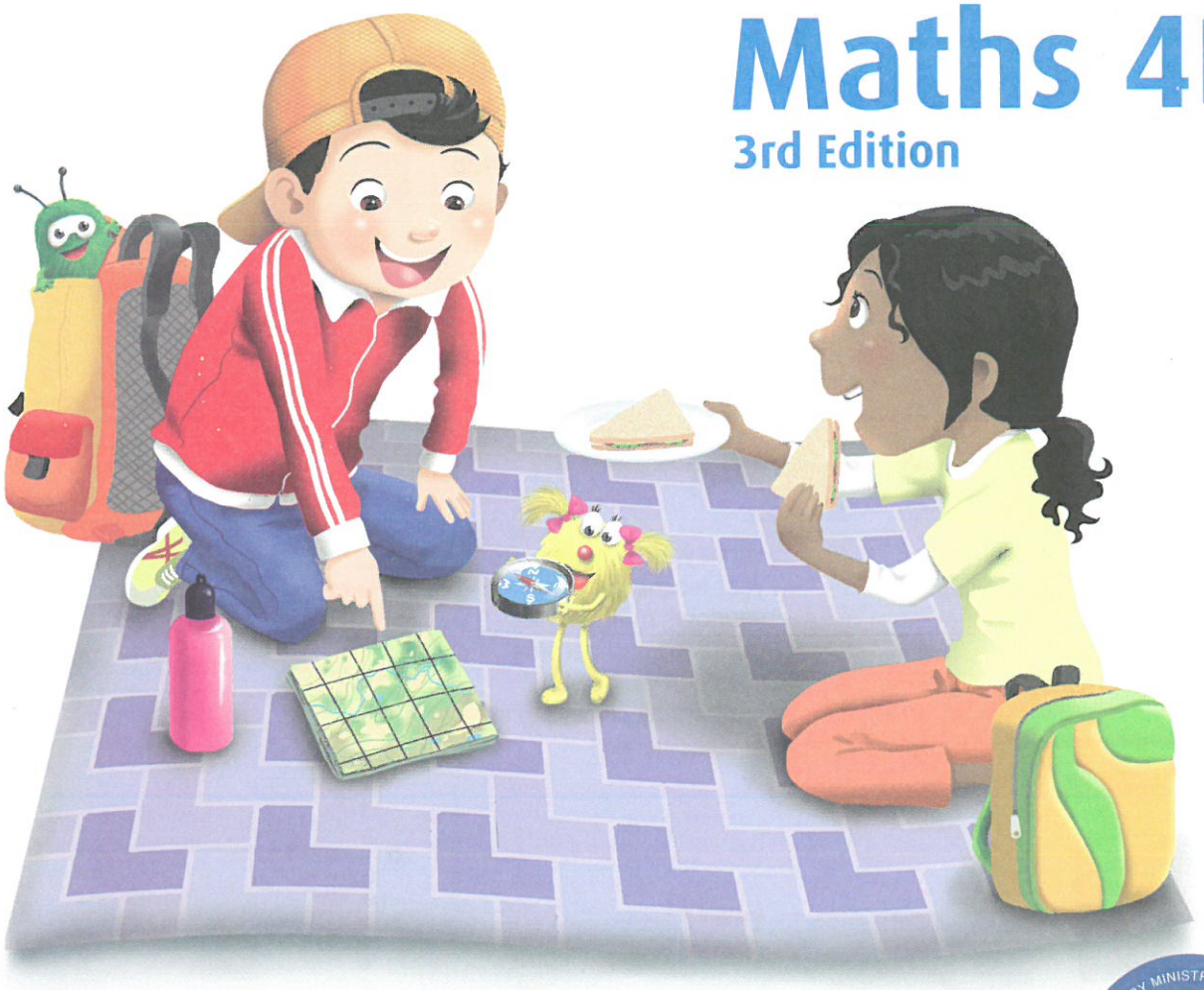


Dr Fong Ho Kheong • Gan Kee Soon • Chelvi Ramakrishnan

APPROVED BY MINISTRY OF EDUCATION SINGAPORE for use from 2016–2020

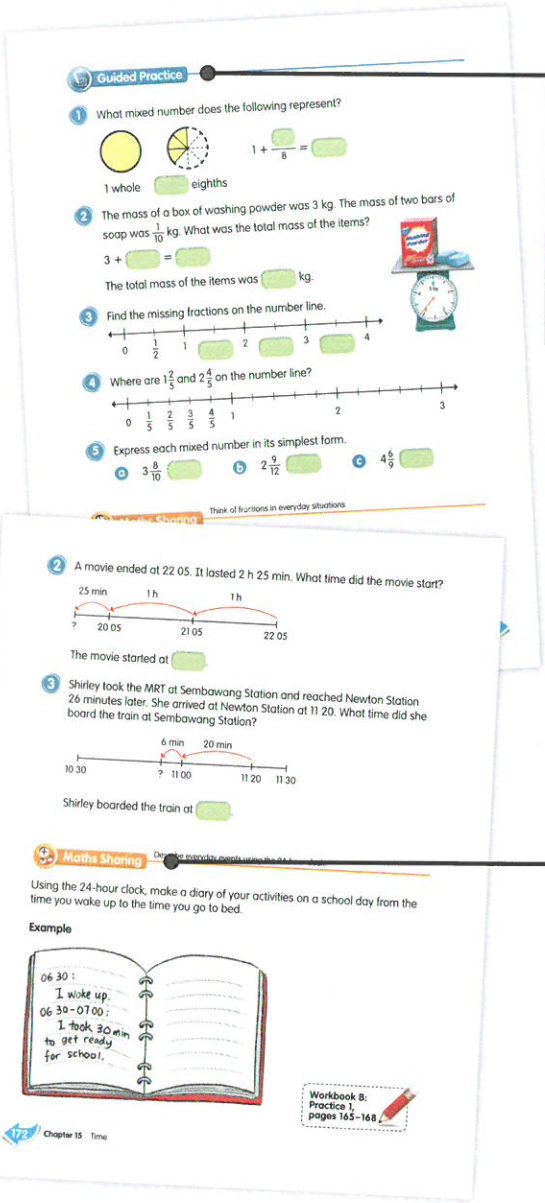
Marshall Cavendish Education

Preface

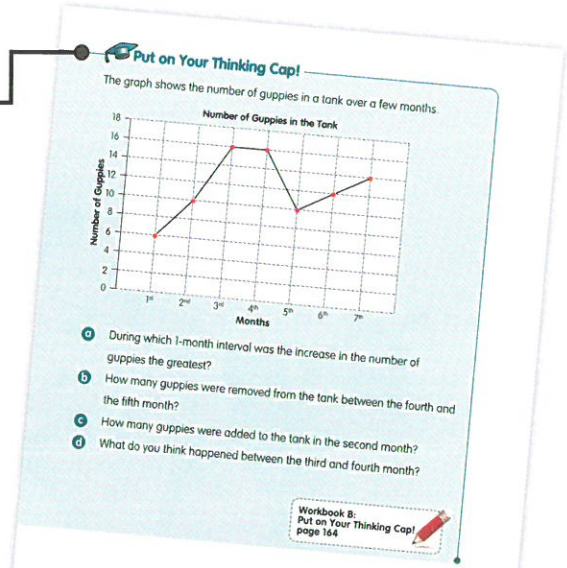
My Pals Are Here! Maths (3rd Edition) is a comprehensive, task-based and learner-centred programme designed to provide pupils with a solid foundation in mathematics and opportunities to become efficient problem solvers.

My Pals Are Here! Maths (3rd Edition) continues to make learning mathematics fun and rewarding through the use of engaging illustrations, photographs, hands-on activities and interactives that help reinforce and consolidate learning for pupils of different abilities.

For the Pupil:



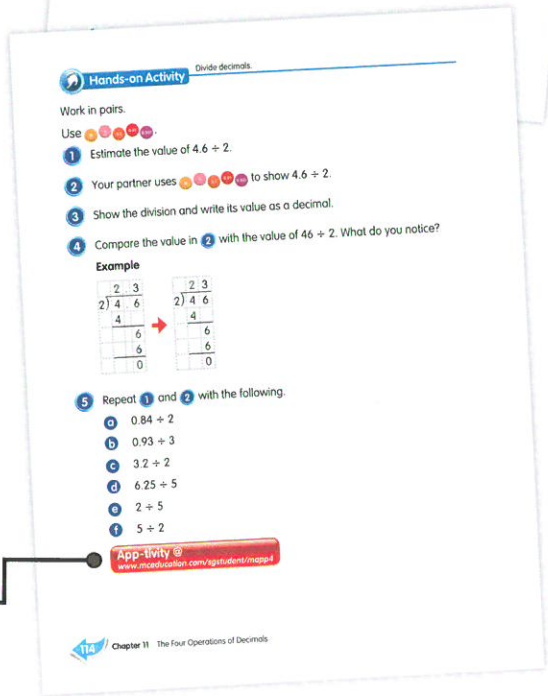
Challenge yourself to solve non-routine questions by applying relevant heuristics and thinking skills in **Put on Your Thinking Cap!**



NEW!

Try practising new concepts learnt with help from your teacher in **Guided Practice**!

Share your thoughts with your teachers, create your own mathematics questions and become aware of your own mathematical thinking in **Maths Sharing**!



NEW!

Master concepts learnt through engaging and interactive applets in **App-tivity**!

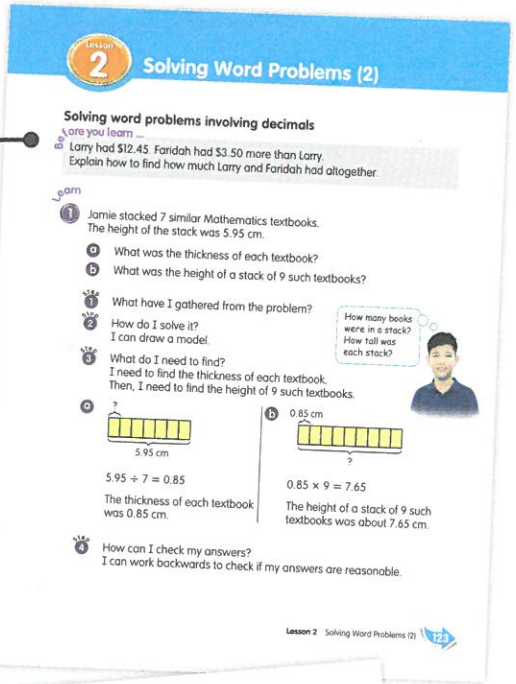
For the Teacher:

NEW!

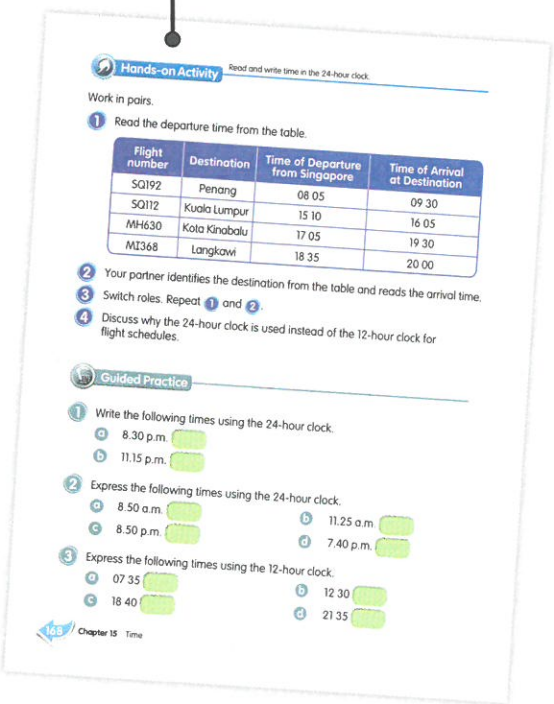
Use scenarios pupils can relate to in the chapter openers to capture their interest, provide an engaging introduction to the topics and jump-start learning.

NEW!

Introduce concepts through context-based tasks in **Before you learn**. At the end of each task, a question is posed to develop pupils' creative and critical thinking skills.

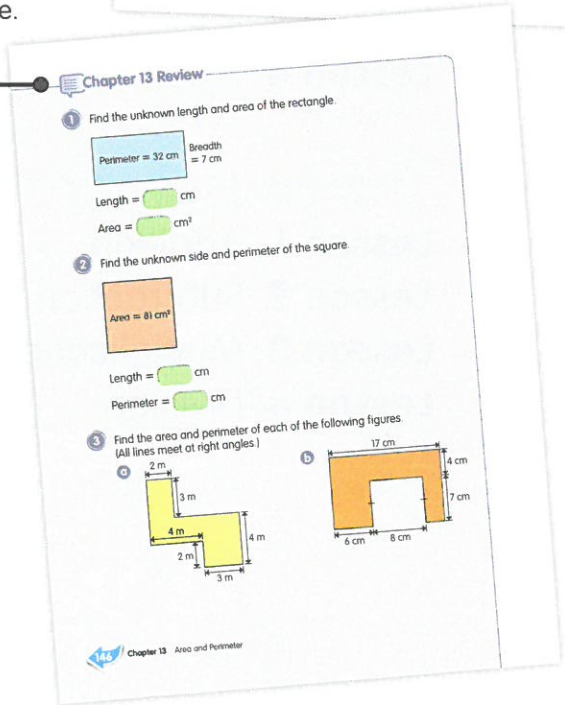


Carry out **Hands-on Activity** to promote active and collaborative learning. Where possible, pupils will complete station-based activities in rotating groups to best utilise class time.



NEW!

Assess understanding when pupils apply concepts learnt in **Review**.



CONTENTS

CHAPTER 8

Fractions

Lessons

1. Mixed Numbers
2. Improper Fractions
3. Improper Fractions and Mixed Numbers
4. Comparing and Ordering Fractions
5. Fraction of a Set

Big Idea

Improper fractions and mixed numbers are used to name fractions greater than 1 whole.

Lesson 1

Mixed Numbers

Understanding mixed numbers

Before you learn ...

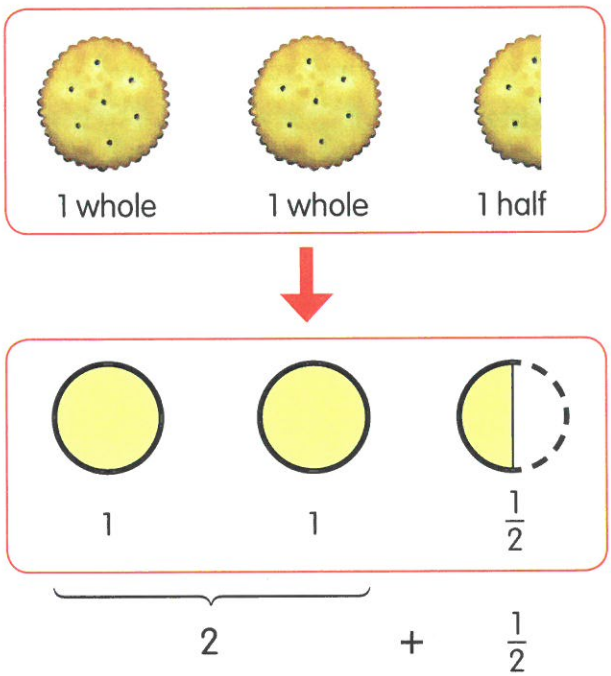
Wesley ate 1 cupcake. He then ate half of another cupcake.

Use  to show the number of cupcakes Wesley ate.

How would you write the number of cupcakes eaten?

Learn

1 Hafiz had two biscuits.
Jess gave him half a biscuit.



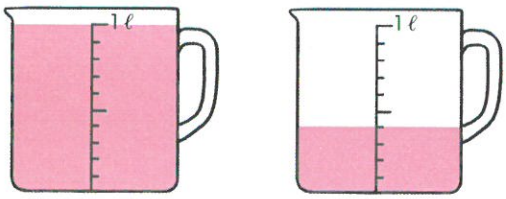
$2 + \frac{1}{2} = 2\frac{1}{2}$

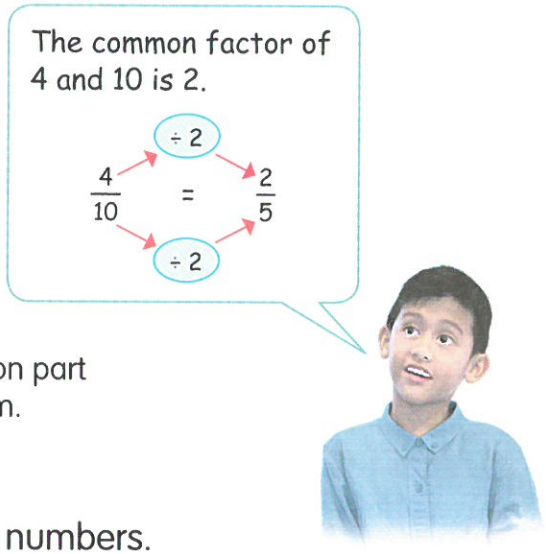
Hafiz had $2\frac{1}{2}$ biscuits.

$2\frac{1}{2}$ is an example of a **mixed number**.

When you add a whole number and a fraction, you get a mixed number.

2 A jug contains $1\frac{4}{10}$ ℓ of strawberry milk.



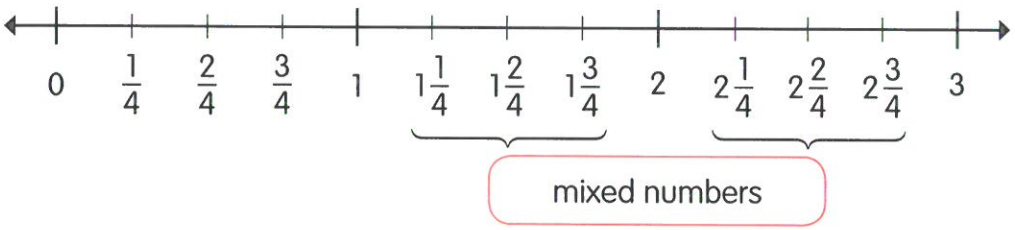


$1 + \frac{4}{10} = 1\frac{4}{10}$

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

Express the fraction part in its simplest form.

3 Number lines can be used to show mixed numbers.



Hands-on Activity

Show mixed numbers.

Work in pairs.

1 Pick a card from a set of $1\frac{1}{2}$.

2 Use  to show the mixed number on the card.

3 Your partner represents the mixed number on a number line.

4 Switch roles. Repeat 1 to 3.

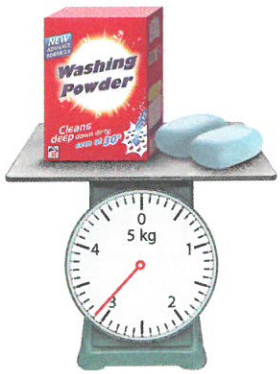
Guided Practice

1 What mixed number does the following represent?

$1 + \frac{\square}{8} = \square$

1 whole ☐ eighths

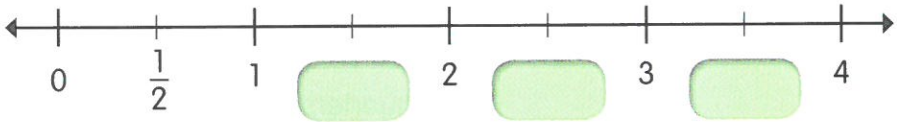
2 The mass of a box of washing powder was 3 kg. The mass of two bars of soap was $\frac{1}{10}$ kg. What was the total mass of the items?



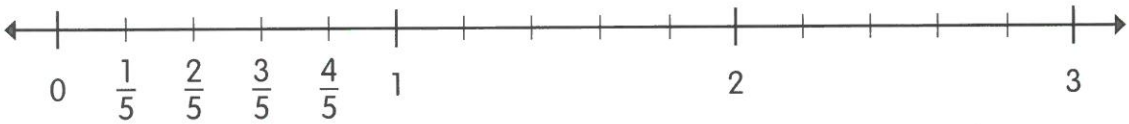
$3 + \square = \square$

The total mass of the items was ☐ kg.

3 Find the missing fractions on the number line.



4 Where are $1\frac{2}{5}$ and $2\frac{4}{5}$ on the number line?



5 Express each mixed number in its simplest form.

a $3\frac{8}{10}$ ☐ b $2\frac{9}{12}$ ☐ c $4\frac{6}{9}$ ☐

Maths Sharing

Think of fractions in everyday situations.

Think of fractions in everyday situations.
Share them with the class.

Example

I bought an eraser. Its length was $4\frac{1}{2}$ cm.

Workbook B: Practice 1, pages 5–6

Lesson 2

Improper Fractions

Understanding improper fractions

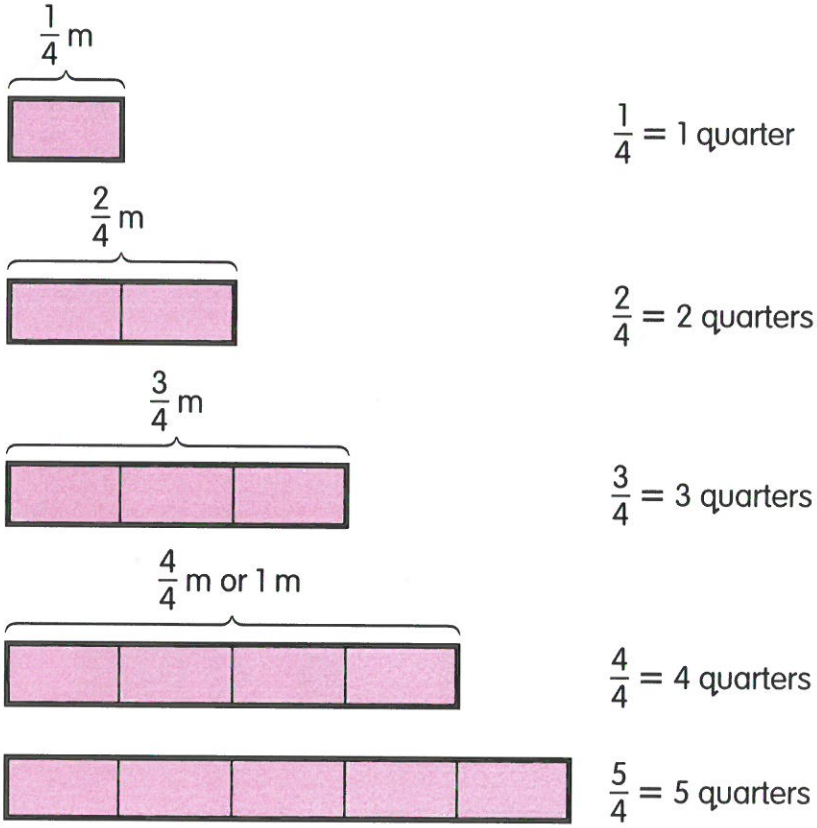
Before you learn ...

Julie had 2 pizzas. She cut each pizza into 3 equal slices.

She ate 4 slices. Use  to represent the amount of pizzas eaten.

Learn

1 Carina has some strips of ribbon.

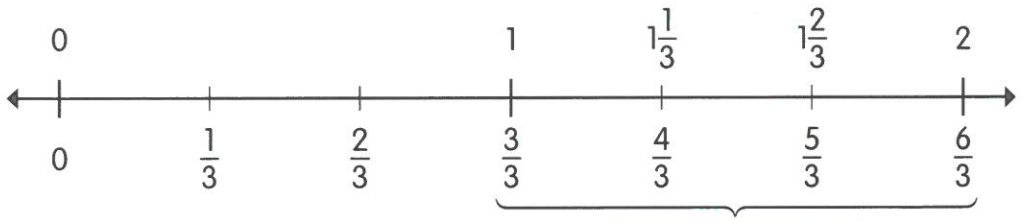


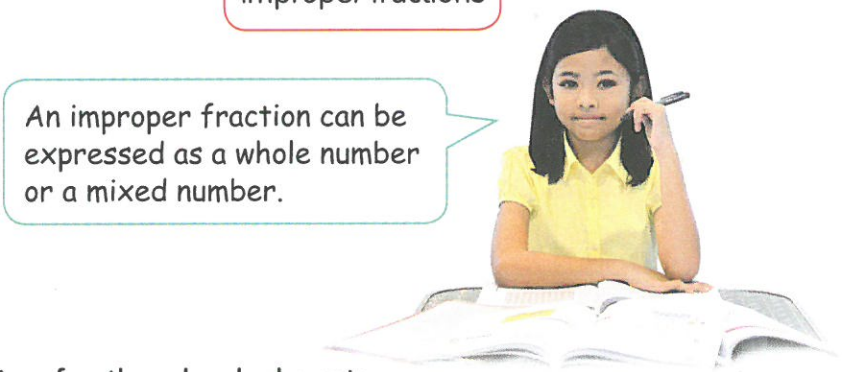
$\frac{4}{4}$ and $\frac{5}{4}$ are examples of **improper fractions**.

$\frac{4}{4}$ — The numerator is equal to or greater than the denominator. — $\frac{5}{4}$

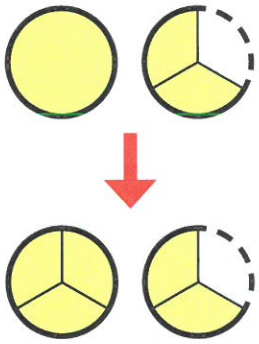
Improper fractions are equal to or greater than 1.

2 Number lines can be used to show improper fractions.





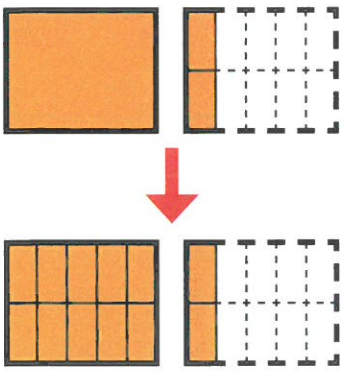
3 Write an improper fraction for the shaded parts.



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

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

4 Write an improper fraction for the shaded parts. Express the fraction in its simplest form.

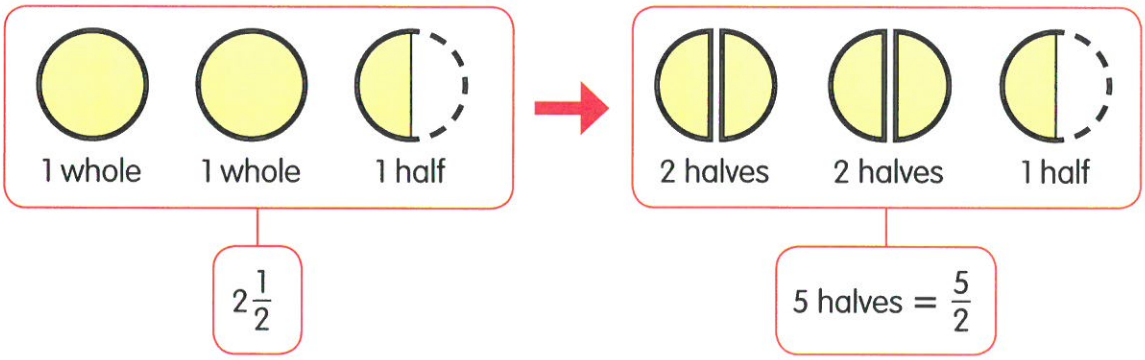


$1 + \frac{2}{10}$

$\frac{10}{10} + \frac{2}{10} = \frac{12}{10}$

$= \frac{6}{5}$

5 How many halves are there in $2\frac{1}{2}$?



There are 5 halves in $2\frac{1}{2}$.

Hands-on Activity

Show improper fractions.

Work in pairs.

1 Pick a card from a set of $\frac{3}{2}$.

2 Use  to show the improper fraction on the card.

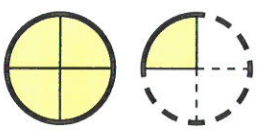
3 Your partner represents the improper fraction on a number line.

4 Switch roles. Repeat **1** to **3**.

Guided Practice

1 Write an improper fraction for the shaded parts.

a

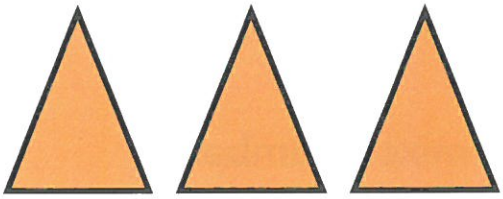


_____ quarters = $\frac{\_\_\_}{\_\_\_}$

b

_____ fifths = $\frac{\_\_\_}{\_\_\_}$

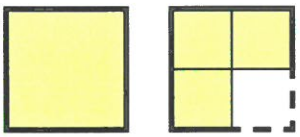
2 How many halves are there in 3?



6 halves = $\frac{\square}{\square}$

There are $\square$ halves in 3.

3 How many quarters are there in $1\frac{3}{4}$?

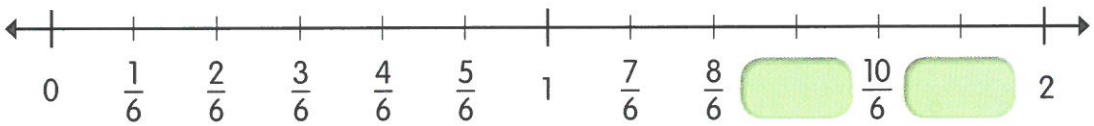


$1\frac{3}{4} = \frac{\square}{\square}$

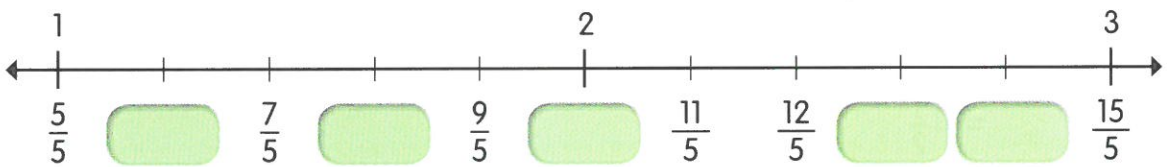
There are $\square$ quarters in $1\frac{3}{4}$.

4 Fill in the missing improper fractions in their simplest forms.

a



b



5 Express each improper fraction in its simplest form.

a $\frac{16}{6}$ $\square$ **b** $\frac{28}{12}$ $\square$ **c** $\frac{15}{10}$ $\square$ **d** $\frac{24}{9}$ $\square$

Workbook B: Practice 2, pages 7–8

Lesson 3

Improper Fractions and Mixed Numbers

Converting an improper fraction to a mixed number

Before you learn ...

Kai Xiang ate $\frac{11}{6}$ pizzas.

Use  to show the number of whole pizza and the fraction of a pizza that he ate.

Learn

1 Convert $\frac{3}{2}$ to a mixed number.

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

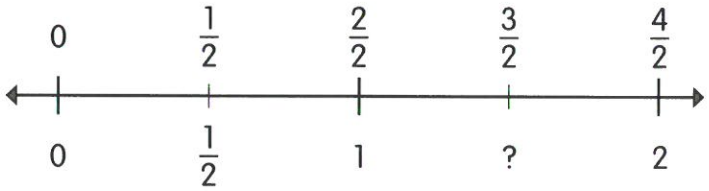
$= 1 + \frac{1}{2}$

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

So, $\frac{3}{2} = 1\frac{1}{2}$.

$\frac{3}{2}$ = 3 halves
= 2 halves + 1 half
= 1 whole + 1 half

2 Number lines can be used to show an improper fraction and its mixed number.



From the number line, $\frac{3}{2}$ is $1\frac{1}{2}$.

Guided Practice

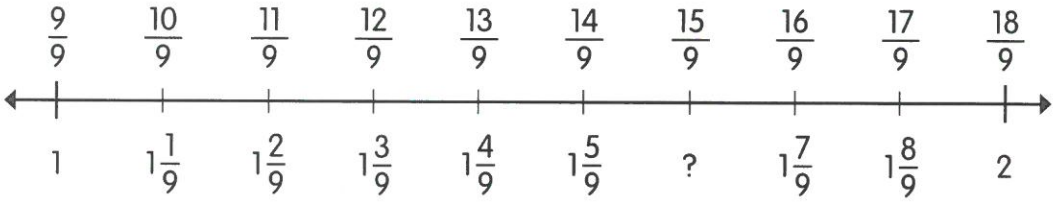
1 Convert $\frac{12}{5}$ to a mixed number.

$\frac{12}{5} = \frac{10}{5} + \frac{\square}{5}$

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

$= \square$

2 Convert $\frac{15}{9}$ to a mixed number. Express your answer in its simplest form.



From the number line, $\frac{15}{9}$ is $\square$.

3 Convert the following improper fractions to mixed numbers. Express your answers in their simplest forms.

a) $\frac{8}{3}$ $\square$

b) $\frac{11}{6}$ $\square$

c) $\frac{22}{4}$ $\square$

d) $\frac{26}{8}$ $\square$

Converting a mixed number to an improper fraction

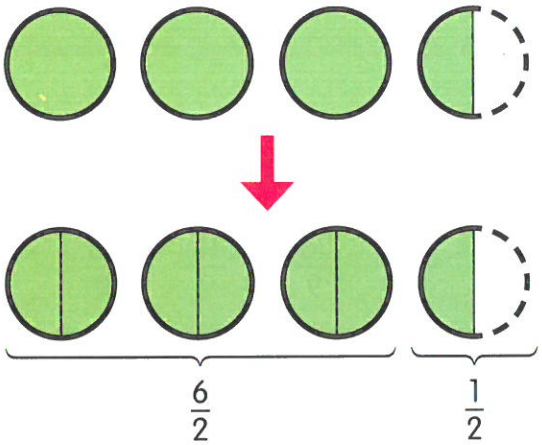
Before you learn ...

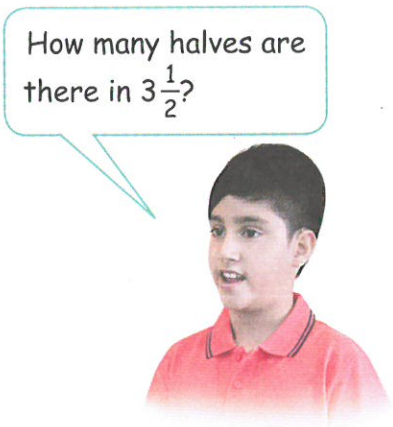
Farid had $2\frac{3}{5}$ pies.

Use  to show the number of slices of pie Farid had.

Learn

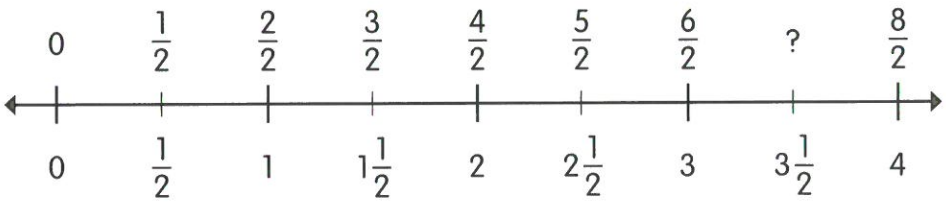
1 Convert $3\frac{1}{2}$ to an improper fraction.





$$3\frac{1}{2} = \frac{6}{2} + \frac{1}{2}$$
$$= \frac{7}{2}$$

2 Number lines can be used to show a mixed number and its improper fraction.



From the number line, $3\frac{1}{2}$ is $\frac{7}{2}$.

Guided Practice

1 Convert $2\frac{4}{6}$ to an improper fraction. Express your answer in its simplest form.

$2\frac{4}{6} = \square + \frac{\square}{6}$

$= \frac{\square}{6} + \frac{\square}{6}$

$= \square$

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

2 wholes $= \frac{\square}{6}$

2 Convert the following mixed numbers to improper fractions.

a $3\frac{1}{5}$ $\square$

b $4\frac{2}{3}$ $\square$

c $1\frac{2}{7}$ $\square$

d $2\frac{3}{4}$ $\square$

Workbook B: Practice 3, pages 9–10

Game

Convert between mixed numbers and improper fractions.

Players: 3
You need:
- $\frac{3}{2}$

1 Shuffle the cards. Give ten cards to each player and put the rest of the stack in the middle of the playing area.

2 Draw a card from the stack. If a match is found, put the pair of cards in front of you. If no match is found, return the card to the bottom of the stack.

Example

$\frac{3}{2}$ is the same as $1\frac{1}{2}$.

Put the pair of cards in front of you.

$\frac{3}{2}$ is not the same as $1\frac{4}{7}$.

Return the card to the bottom of the stack and end your turn.

3 Take turns and repeat 2.

The first player who matches all the cards wins the game.

App-tivity @ www.mceducation.com/sgstudent/mapp4

Lesson 4

Comparing and Ordering Fractions

Recall

1 Which is greater, $\frac{3}{7}$ or $\frac{3}{8}$?

$\frac{3}{7}$ $\frac{3}{8}$

$\frac{3}{7}$ is greater than $\frac{3}{8}$.

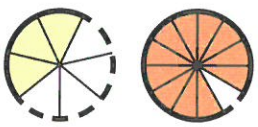
2 Which is smaller, $\frac{5}{6}$ or $\frac{7}{12}$?

$\frac{5}{6}$ = $\frac{10}{12}$ $\frac{7}{12}$

$\frac{7}{12}$ is smaller than $\frac{5}{6}$.

3 Which is greater, $\frac{3}{7}$ or $\frac{11}{12}$?

We compare $\frac{3}{7}$ and $\frac{11}{12}$ to $\frac{1}{2}$.



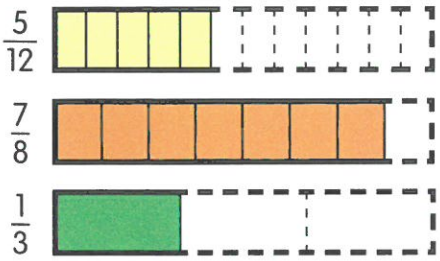
$\frac{3}{7}$ $\frac{11}{12}$

$\frac{3}{7}$ is smaller than $\frac{1}{2}$.

$\frac{11}{12}$ is greater than $\frac{1}{2}$.

So, $\frac{11}{12}$ is greater than $\frac{3}{7}$.

4 Arrange $\frac{5}{12}$, $\frac{7}{8}$ and $\frac{1}{3}$ in order, beginning with the smallest.



Compare with $\frac{1}{2}$.

$\frac{7}{8}$ is greater than $\frac{1}{2}$.

$\frac{5}{12}$ and $\frac{1}{3}$ are smaller than $\frac{1}{2}$.

$\frac{7}{8}$ is the greatest.

Compare $\frac{5}{12}$ and $\frac{1}{3}$.

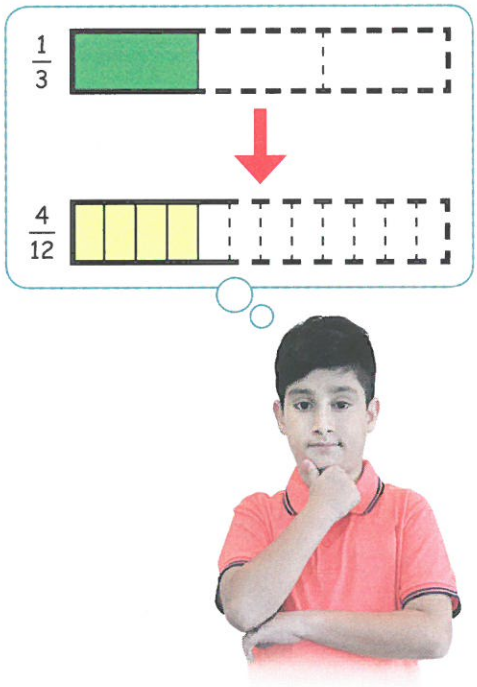
$\frac{1}{3} = \frac{4}{12}$

$\frac{1}{3}$ is smaller than $\frac{5}{12}$.

$\frac{1}{3}$ is the smallest.

$\frac{1}{3}$, $\frac{5}{12}$, $\frac{7}{8}$

smallest



Comparing and ordering fractions

Before you learn ...

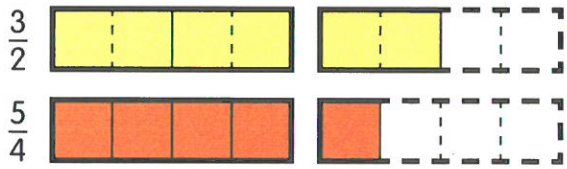
Liana ate $\frac{9}{4}$ pizzas.

Liana ate $2\frac{1}{4}$ pizzas.

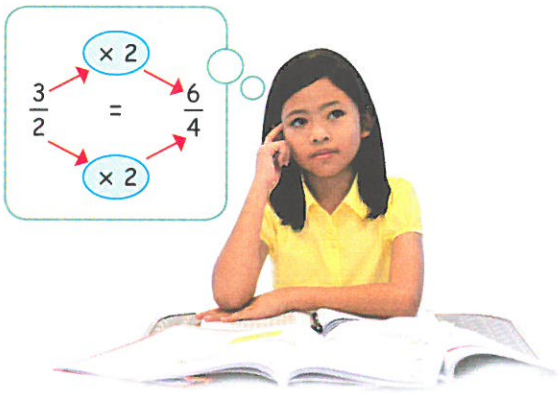
Did Liana eat the same amount of pizzas? Explain.

Learn

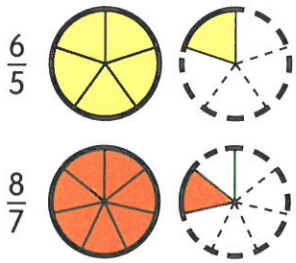
1 **a** Which is smaller, $\frac{3}{2}$ or $\frac{5}{4}$?

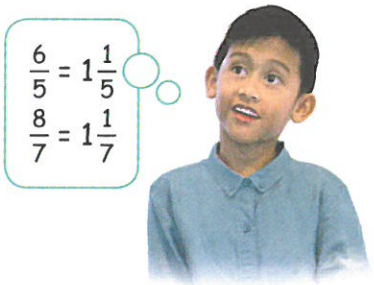


$\frac{5}{4}$ is smaller than $\frac{3}{2}$.



b Which is greater, $\frac{6}{5}$ or $\frac{8}{7}$?





Since $\frac{6}{5}$ and $\frac{8}{7}$ are both greater than 1, compare $\frac{1}{5}$ and $\frac{1}{7}$.

$\frac{1}{5}$ is greater than $\frac{1}{7}$.

So, $\frac{6}{5}$ is greater than $\frac{8}{7}$.

2 Which is smaller, $1\frac{3}{7}$ or $1\frac{2}{9}$?

$1\frac{3}{7}$

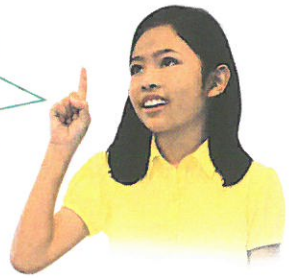
$1\frac{2}{9}$

Convert the mixed numbers to fractions with a common denominator.

$1\frac{3}{7} = 1\frac{27}{63}$

$1\frac{2}{9} = 1\frac{14}{63}$

So, $1\frac{2}{9}$ is smaller than $1\frac{3}{7}$.



3 Which is smaller, $2\frac{2}{5}$ or $\frac{9}{4}$?

$2\frac{2}{5}$

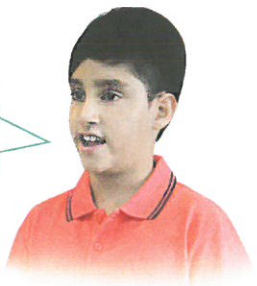
$\frac{9}{4}$

Convert the mixed number to an improper fraction with a common denominator.

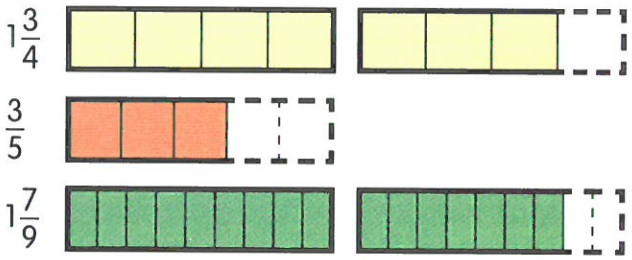
$\frac{9}{4} = \frac{45}{20}$

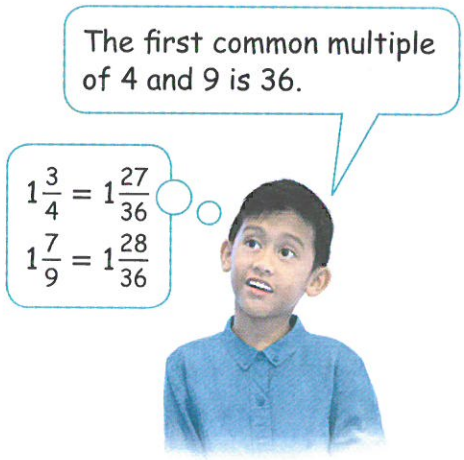
$2\frac{2}{5} = 2\frac{8}{20} = \frac{48}{20}$

So, $\frac{9}{4}$ is smaller than $2\frac{2}{5}$.



4 Arrange $1\frac{3}{4}$, $\frac{3}{5}$ and $1\frac{7}{9}$ in order, beginning with the smallest.



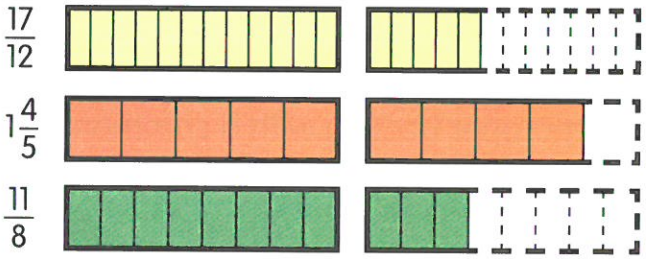


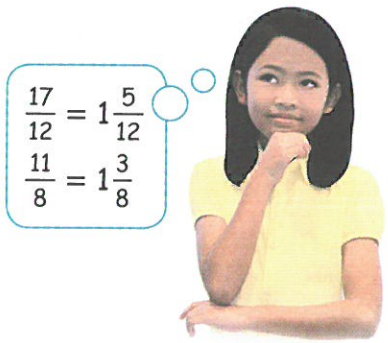
$\frac{3}{5}$ is smaller than 1. So, $\frac{3}{5}$ is the smallest.

$1\frac{7}{9}$ is the greatest.

$\frac{3}{5}$, $1\frac{3}{4}$, $1\frac{7}{9}$
smallest

5 Arrange $\frac{17}{12}$, $1\frac{4}{5}$ and $\frac{11}{8}$ in increasing order.





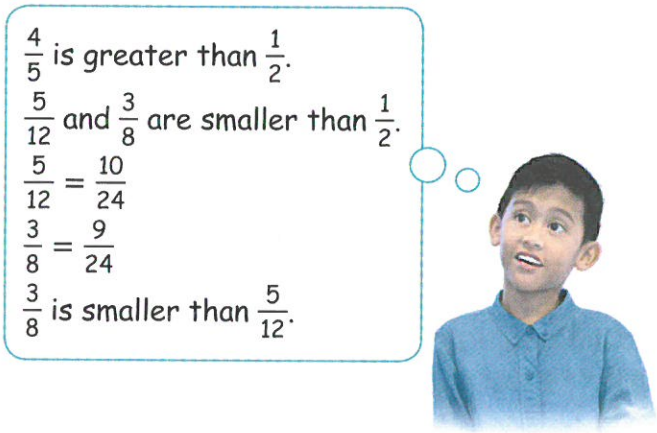
Since the whole numbers are the same, compare the fraction parts.

Compare $\frac{5}{12}$, $\frac{4}{5}$ and $\frac{3}{8}$ to $\frac{1}{2}$.

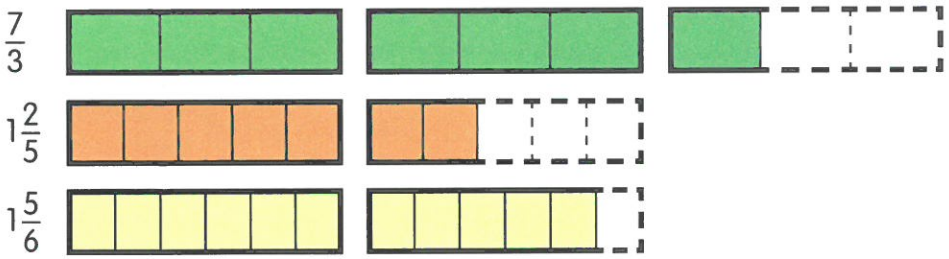
$\frac{4}{5}$ is the greatest.

$\frac{3}{8}$ is the smallest.

Increasing order: $\frac{11}{8}$, $\frac{17}{12}$, $1\frac{4}{5}$



6 Arrange $\frac{7}{3}$, $1\frac{2}{5}$ and $1\frac{5}{6}$ in decreasing order.



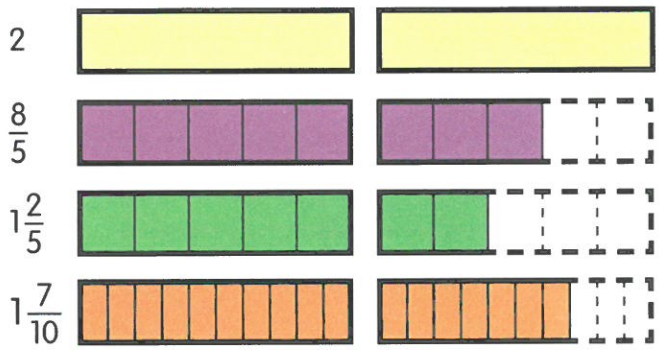
$\frac{7}{3}$ is greater than 2. So, $\frac{7}{3}$ is the greatest.

Compare $1\frac{2}{5}$ and $1\frac{5}{6}$.

$1\frac{2}{5}$ is the smallest.

Decreasing order: $\frac{7}{3}$, $1\frac{5}{6}$, $1\frac{2}{5}$

7 Arrange 2, $\frac{8}{5}$, $1\frac{2}{5}$ and $1\frac{7}{10}$ in increasing order.



$\frac{8}{5}$, $1\frac{2}{5}$ and $1\frac{7}{10}$ are smaller than 2. So, 2 is the greatest.

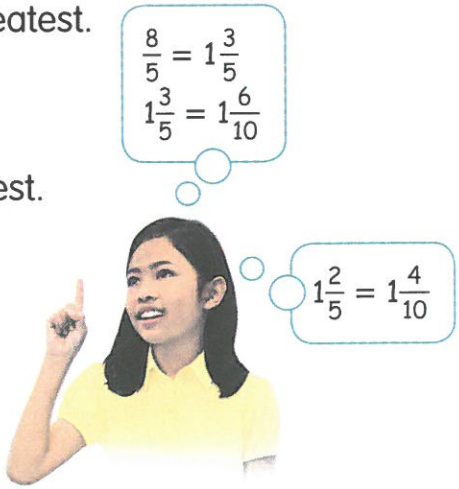
Compare $\frac{8}{5}$, $1\frac{2}{5}$ and $1\frac{7}{10}$.

$1\frac{2}{5}$ is smaller than $\frac{8}{5}$ and $1\frac{7}{10}$. So, $1\frac{2}{5}$ is the smallest.

Compare $\frac{8}{5}$ and $1\frac{7}{10}$.

$\frac{8}{5}$ is smaller than $1\frac{7}{10}$.

Increasing order: $1\frac{2}{5}$, $\frac{8}{5}$, $1\frac{7}{10}$, 2



Hands-on Activity

Compare fractions.

Work in pairs.

1. Pick one card from a set of $1\frac{1}{2}$ and one card from a set of $\frac{3}{2}$.
2. Use  to compare the fractions.
3. Your partner checks the answer without using  .
4. Switch roles. Repeat 1 to 3.

Guided Practice

1. Which is smaller, $\frac{7}{6}$ or $\frac{4}{3}$?

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

   So, $\square$ is smaller than $\square$.

2. Which is greater, $2\frac{3}{4}$ or $2\frac{2}{3}$?

   $2\frac{3}{4} = 2\frac{\square}{12}$

   $2\frac{2}{3} = 2\frac{\square}{12}$

   $\square$ is greater than $\square$.

3 Which is smaller, $\frac{14}{5}$ or $2\frac{7}{8}$?

$\frac{14}{5} = 2\frac{\square}{5} = 2\frac{\square}{40}$

$2\frac{7}{8} = 2\frac{\square}{40}$

$\square$ is smaller than $\square$.

4 Arrange $1\frac{3}{4}$, $\frac{2}{7}$ and $\frac{19}{12}$ in increasing order.

Increasing order: $\square$, $\square$, $\square$

5 Represent $\frac{11}{3}$, $\frac{3}{4}$, 3 and $2\frac{1}{2}$ on the number line. Then, arrange the fractions in decreasing order.

Decreasing order: $\square$, $\square$, $\square$, $\square$

Workbook B: Practice 4, pages 11–16

Lesson 5

Fraction of a Set

Finding a fraction of a set

Before you learn ...

What is $\frac{3}{5}$ of 20?

Use 🔴 to show.

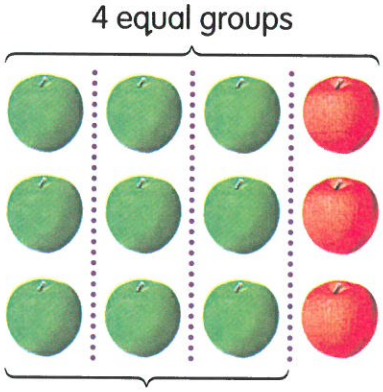
Learn

1 Julie has 4 apples.

3 out of 4 apples are green.

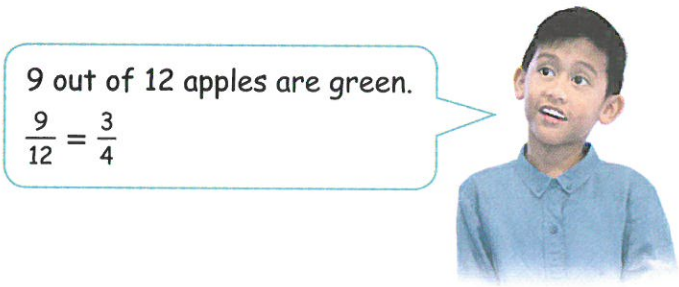
$\frac{3}{4}$ of the apples are green.

2 Mark has a set of 12 apples.

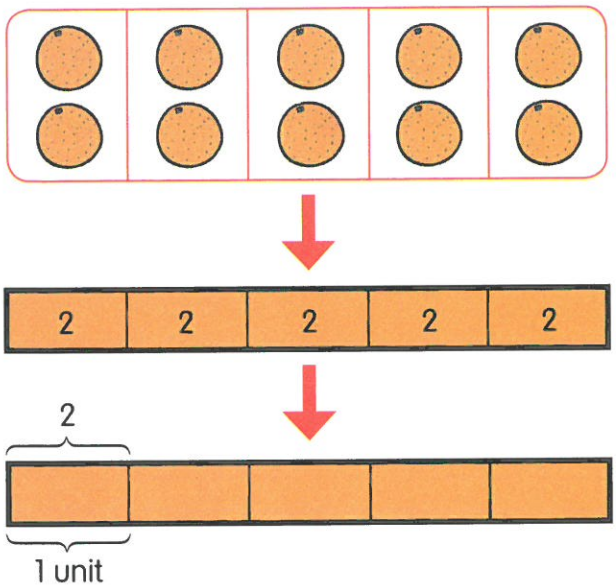


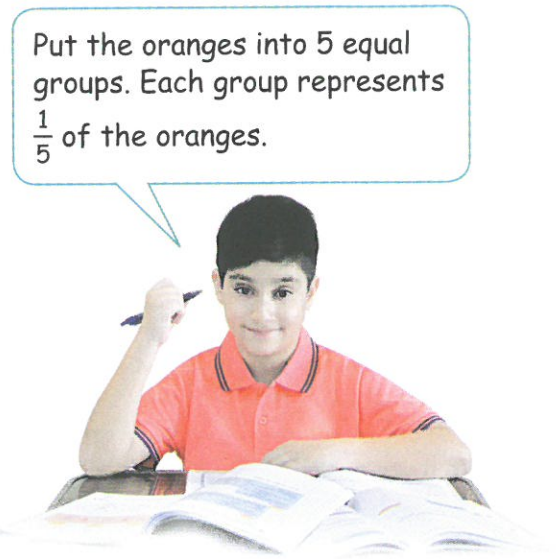
3 out of 4 equal groups of apples are green.

$\frac{3}{4}$ of the apples are green.



3 Tom had 10 oranges. He gave $\frac{4}{5}$ of the oranges to Rachel.
How many oranges did Tom give to Rachel?

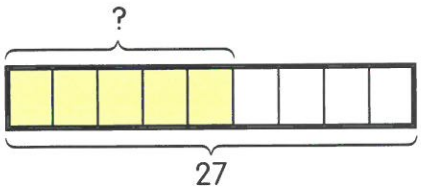




5 units = 10
1 unit = 10 ÷ 5
= 2
4 units = 2 × 4
= 8

Tom gave Rachel 8 oranges.

4 Find the value of $\frac{5}{9}$ of 27.

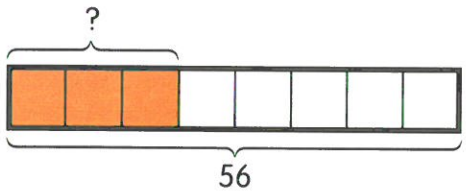


The shaded parts make up $\frac{5}{9}$ of the set.

9 units = 27
1 unit = 27 ÷ 9
= 3
5 units = 3 × 5
= 15

So, $\frac{5}{9}$ of 27 is 15.

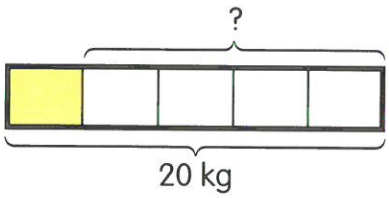
5 Janice made 56 strawberry tarts. She sold $\frac{3}{8}$ of the strawberry tarts. How many strawberry tarts did Janice sell?



8 units = 56
1 unit = 56 ÷ 8
= 7
3 units = 7 × 3
= 21

Janice sold 21 strawberry tarts.

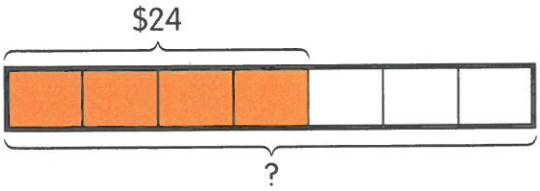
6 Mr Tan bought 20 kg of rice. He gave $\frac{1}{5}$ of the rice to his mother. How much rice did Mr Tan have left?



5 units = 20
1 unit = 20 ÷ 5
= 4
4 units = 4 × 4
= 16

Mr Tan had 16 kg of rice left.

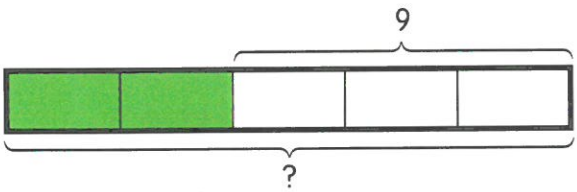
7 Luke spent $\frac{4}{7}$ of his money. He spent $24.
How much money did Luke have at first?



4 units = $24
1 unit = $24 ÷ 4
= $6
7 units = $6 × 7
= $42

Luke had $42 at first.

8 Peiling had some stamps.
She gave her sister $\frac{2}{5}$ of the stamps and had 9 stamps left.
How many stamps did Peiling have at first?



3 units = 9
1 unit = 9 ÷ 3
= 3
5 units = 3 × 5
= 15

Peiling had 15 stamps at first.

Hands-on Activity

Use 🔴 to show a fraction of a set.

Work in pairs.

1. Count 16 🔴.
2. Your partner shows $\frac{3}{4}$ of the 16 🔴 and explains.

   Example

   I divide the counters into 4 equal groups.

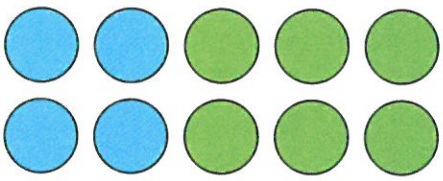
   $\frac{3}{4}$ is 3 out of 4 equal groups.
3. Switch roles. Repeat 1 and 2 with the following.

   a $\frac{2}{5}$ of 15

   b $\frac{4}{7}$ of 14

Guided Practice

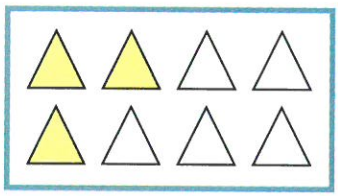
1. Fill in the missing fractions.



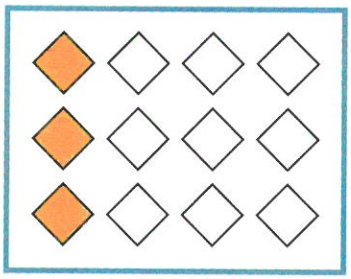
_____ of the circles are blue.

_____ of the circles are green.

2. Which of the following shows $\frac{1}{4}$ of the set shaded? _____

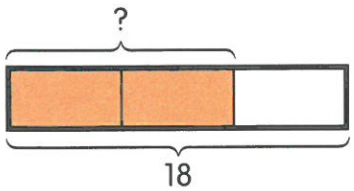


A



B

3 Find $\frac{2}{3}$ of 18.



[ ] units = [ ]

1 unit = [ ] [ ] [ ]

= [ ]

[ ] units = [ ] [ ] [ ]

= [ ]

So, $\frac{2}{3}$ of 18 is [ ].

4 Find the value of each of the following.

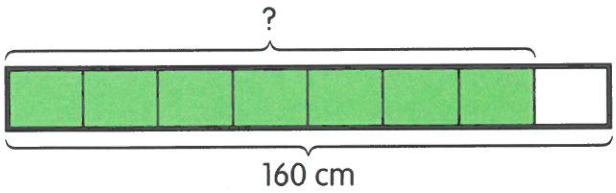
(a) $\frac{1}{3}$ of 12 [ ]

(b) $\frac{3}{4}$ of 20 [ ]

(c) $\frac{4}{5}$ of 25 [ ]

(d) $\frac{5}{7}$ of 42 [ ]

5 Sam had a 160 cm rope. He cut $\frac{7}{8}$ of the rope. What was the length of the rope cut?



8 units = 160

1 unit = [ ] [ ] [ ]

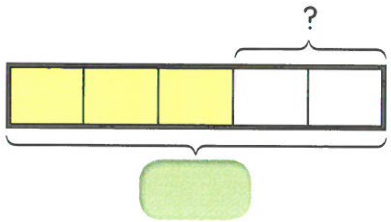
= [ ]

[ ] units = [ ] [ ] [ ]

= [ ]

The length of the rope cut was [ ] cm.

6 Lisa made 45 sandwiches. $\frac{3}{5}$ of the sandwiches were tuna sandwiches. The rest were sardine sandwiches. How many sardine sandwiches did Lisa make?



[ ] units = [ ]

1 unit = [ ] [ ]

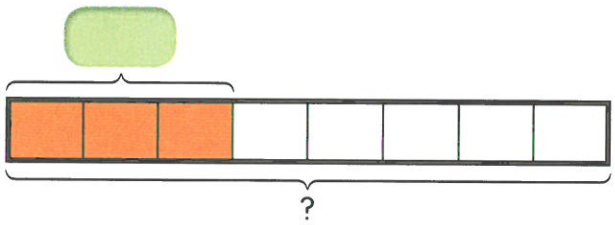
= [ ]

[ ] units = [ ] [ ]

= [ ]

Lisa made [ ] sardine sandwiches.

7 A group of pupils visited a museum. $\frac{3}{8}$ of the pupils are girls. There are 27 girls. How many pupils visited the museum?



[ ] units = [ ]

[ ] unit = [ ] [ ]

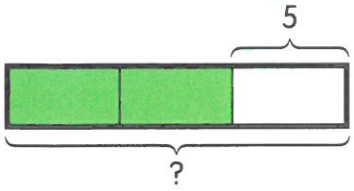
= [ ]

[ ] units = [ ] [ ]

= [ ]

[ ] pupils visited the museum.

8 Raj bought some sweets. He gave $\frac{2}{3}$ of the sweets to his friends and had 5 sweets left. How many sweets did Raj buy?



[ ] unit = [ ]

[ ] units = [ ] [ ] [ ]

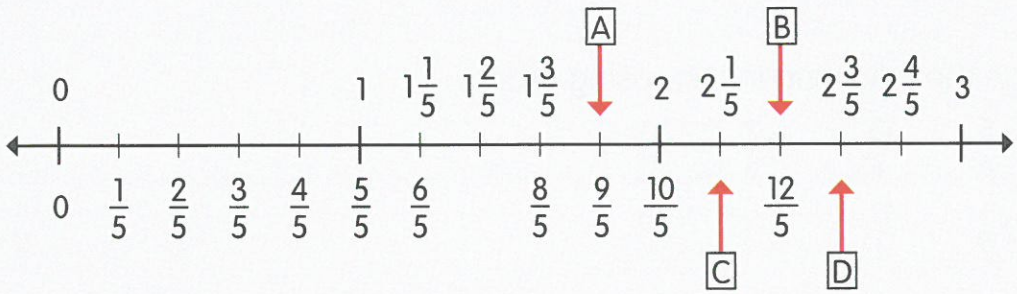
= [ ]

Raj bought [ ] sweets.

Workbook B: Practice 5, pages 17–20

Chapter 8 Review

1 Find the missing improper fractions and mixed numbers represented by the letters.

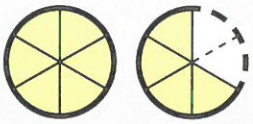


2 How many sevenths are there in $1\frac{4}{7}$?

$1\frac{4}{7}$ = [ ]

There are [ ] sevenths in $1\frac{4}{7}$.

3 What mixed number and improper fraction does the following represent? Express your answers in their simplest forms.



Mixed number:

Improper fraction:

4 Convert each improper fraction to a mixed number.

a $\frac{9}{4}$

b $\frac{23}{8}$

5 Convert each mixed number to an improper fraction.

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

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

6 Which is greater?

a $\frac{11}{7}$ or $\frac{7}{3}$

b $1\frac{3}{5}$ or $1\frac{9}{11}$

7 Which is smaller?

a $2\frac{5}{6}$ or $\frac{9}{2}$

b $\frac{8}{3}$ or $\frac{15}{6}$

8 Arrange the following in increasing order.

a $2\frac{5}{6}$, $\frac{13}{4}$, $2\frac{2}{3}$

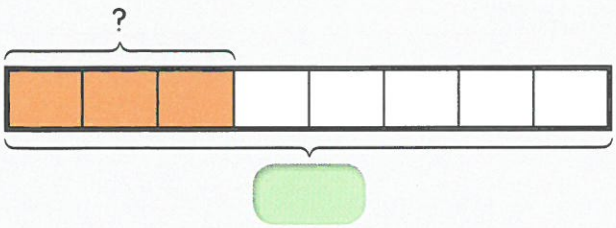
b $2\frac{1}{2}$, $\frac{11}{4}$, $\frac{5}{7}$

9 Arrange the following in decreasing order.

a $\frac{9}{2}$, $2\frac{5}{12}$, $\frac{8}{3}$

b 2, $\frac{23}{9}$, $\frac{2}{3}$, $2\frac{4}{5}$

10 There were 72 cherries in a box. Julie and her sister ate $\frac{3}{8}$ of the cherries. How many cherries did they eat?



8 units = 72

1 unit = ☐ ☐ ☐

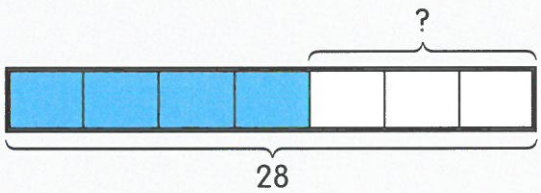
= ☐

☐ units = ☐ ☐ ☐

= ☐

They ate ☐ cherries.

11 There are 28 flowers in a garden. $\frac{4}{7}$ of the flowers are roses. The rest are sunflowers. How many sunflowers are there?



☐ units = ☐

1 unit = ☐ ☐ ☐

= ☐

☐ units = ☐ ☐ ☐

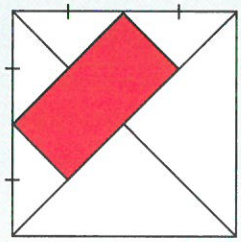
= ☐

There are ☐ sunflowers.

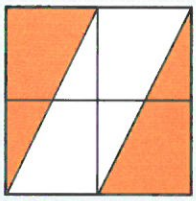
Workbook B:
Chapter 8 Review, pages 21–24
Maths Journal, page 25

Put on Your Thinking Cap!

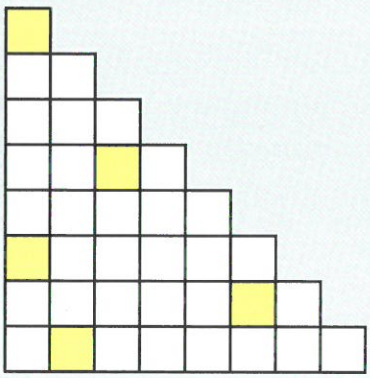
1. What fraction of the square is shaded?



2. What fraction of the square is shaded?



3. The figure is made up of identical squares. How many more squares need to be shaded so that $\frac{1}{4}$ of the figure is shaded?



Workbook B:
Put on Your Thinking Cap!
page 26

CHAPTER 9

Addition and Subtraction of Fractions

Lessons

1. Adding and Subtracting Fractions
2. Word Problems

Big Idea

Adding and subtracting fractions can involve fractions greater than a whole.

Lesson 1

Adding and Subtracting Fractions

Adding fractions

Before you learn ...

Mindy and Fairuz bought 2 pies of the same size. Mindy ate $\frac{5}{8}$ of her pie. Fairuz ate $\frac{7}{8}$ of his pie. Use  to show the fraction of pies they ate altogether.

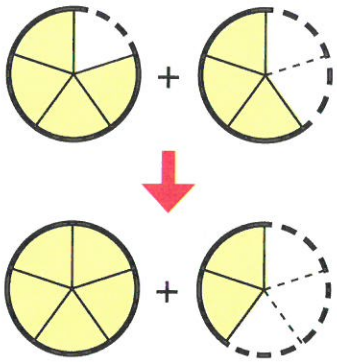
Learn

1 Cary had $\frac{4}{5}$ of a cake. Hilmi had $\frac{3}{5}$ of a similar cake. How many cakes did they have altogether?

Add $\frac{4}{5}$ and $\frac{3}{5}$ to find out.

$\frac{4}{5} + \frac{3}{5} = \frac{7}{5}$

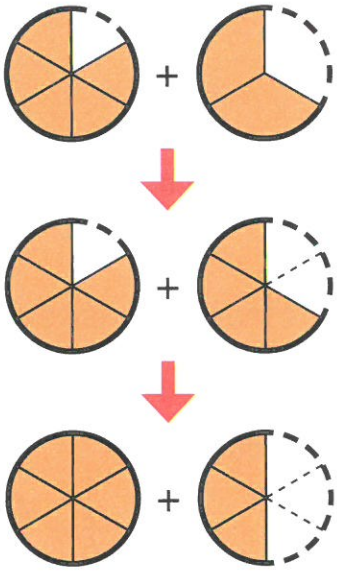
$= 1\frac{2}{5}$



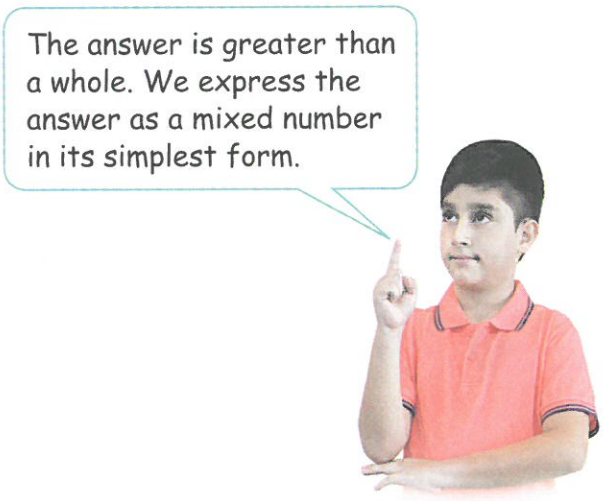
They had $1\frac{2}{5}$ cakes altogether.

2 Find the sum of $\frac{5}{6}$ and $\frac{2}{3}$. Express your answer as a mixed number in its simplest form.

$$\frac{5}{6} + \frac{2}{3}$$
$$= \frac{5}{6} + \frac{4}{6}$$
$$= \frac{9}{6}$$
$$= 1\frac{3}{6}$$
$$= 1\frac{1}{2}$$

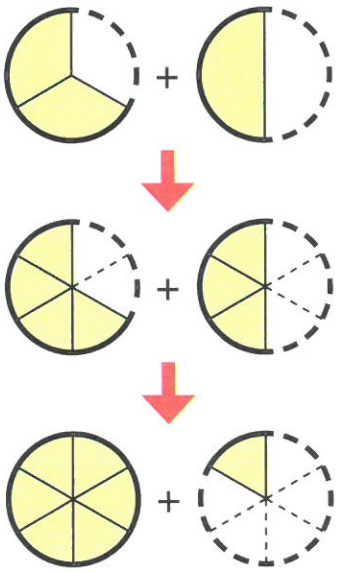


The sum of $\frac{5}{6}$ and $\frac{2}{3}$ is $1\frac{1}{2}$.



3 Add $\frac{2}{3}$ and $\frac{1}{2}$. Express your answer as a mixed number in its simplest form.

$$\frac{2}{3} + \frac{1}{2}$$
$$= \frac{4}{6} + \frac{3}{6}$$
$$= \frac{7}{6}$$
$$= 1\frac{1}{6}$$



The sum of $\frac{2}{3}$ and $\frac{1}{2}$ is $1\frac{1}{6}$.

Hands-on Activity

Add fractions using  .

Work in pairs.

1. Use  to add $\frac{5}{6}$ and $\frac{1}{3}$.
2. Write the equation. Express your answer as an improper fraction in its simplest form.
3. Your partner checks your answer and expresses the answer as a mixed number.
4. Switch roles. Repeat 1 to 3 with these fractions.

   a) $\frac{3}{8} + \frac{3}{4}$ b) $\frac{4}{5} + \frac{1}{2}$ c) $\frac{1}{6} + \frac{4}{9} + \frac{5}{9}$

Guided Practice

1. Add. Express your answers as mixed numbers in their simplest forms.

   a) $\frac{7}{9} + \frac{5}{9} = \frac{\square}{9}$
   $= \square$

   b) $\frac{3}{4} + \frac{5}{8} = \frac{\square}{\square} + \frac{5}{8}$
   $= \square$

   c) $\frac{7}{10} + \frac{1}{2} = \square$

   d) $\frac{2}{3} + \frac{5}{7} = \square$

   e) $\frac{5}{6} + \frac{7}{8} = \square$

   f) $\frac{11}{12} + \frac{1}{12} + \frac{1}{6} = \square$

   g) $\frac{5}{8} + \frac{1}{4} + \frac{3}{8} = \square$

Workbook B: Practice 1, pages 27–28

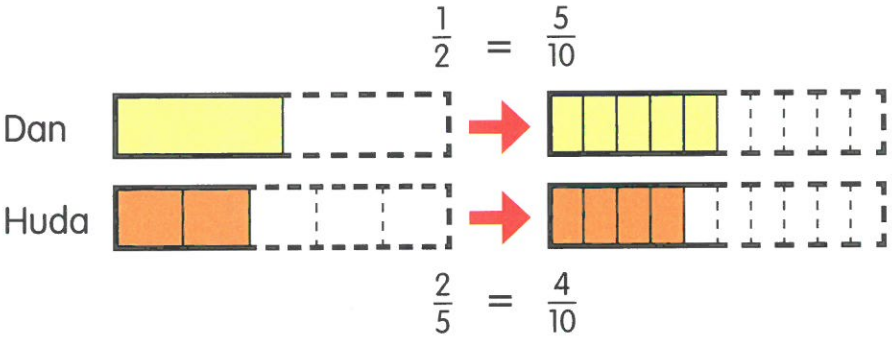
Subtracting fractions

Before you learn ...

Nina bought 2 bars of chocolate. She ate $\frac{3}{5}$ of a bar of chocolate.
Use  to show the number of bars of chocolate she had left.

Learn

1 Dan drank $\frac{1}{2}$ a cup of water. Huda drank $\frac{2}{5}$ cup of water.
How much more of a cup of water did Dan drink than Huda?

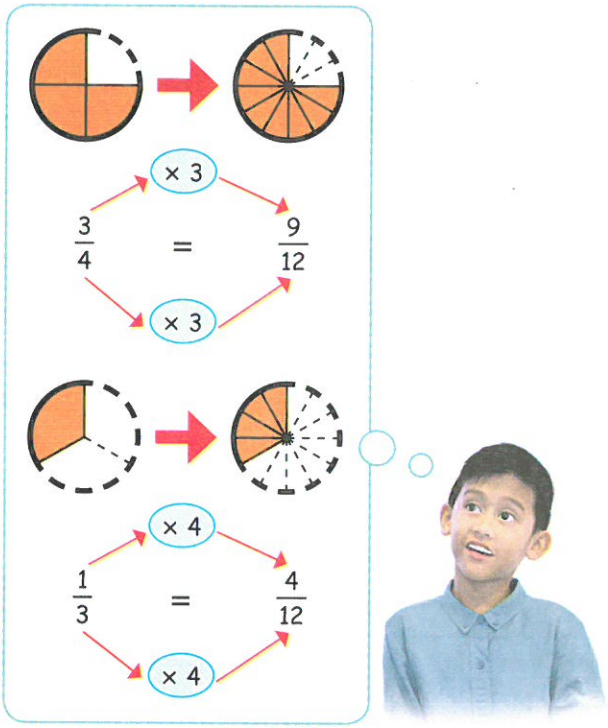


$$\frac{1}{2} - \frac{2}{5} = \frac{5}{10} - \frac{4}{10}$$
$$= \frac{1}{10}$$

Dan drank $\frac{1}{10}$ of a cup of water more than Huda.

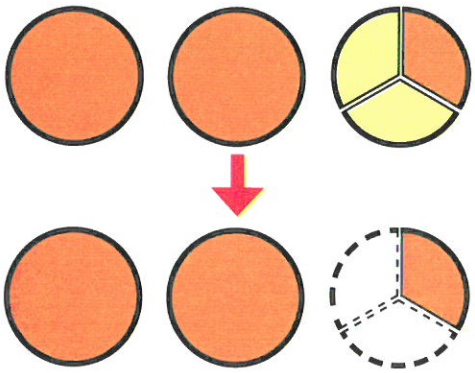
2 Find the value of $\frac{3}{4} - \frac{1}{3}$.

$$\frac{3}{4} - \frac{1}{3} = \frac{9}{12} - \frac{4}{12}$$
$$= \frac{5}{12}$$



3 John had 3 cakes. He ate $\frac{2}{3}$ of a cake. How many cakes did he have left?

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



Take 1 whole from 3.

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

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

He had $2\frac{1}{3}$ cakes left.

Hands-on Activity

Subtract fractions using  .

Work in pairs.

1. Use  to subtract $\frac{5}{6}$ from 3.
2. Write the equation. Express your answer as a mixed number or fraction.
3. Your partner checks your answer.
4. Switch roles. Repeat 1 to 3 with the following.
   - a $4 - \frac{4}{5}$
   - b $3 - \frac{2}{7}$
   - c $\frac{1}{2} - \frac{1}{3}$

Guided Practice

1. Subtract. Express your answers in their simplest forms.

   a $\frac{2}{3} - \frac{5}{12} = \frac{\square}{12} - \frac{5}{12}$

   $= \square$

   b $\frac{8}{9} - \frac{1}{4} = \square$

   c $\frac{2}{3} - \frac{1}{4} = \square$

   d $\frac{5}{6} - \frac{1}{2} - \frac{1}{6} = \frac{5}{6} - \frac{\square}{6} - \frac{1}{6}$

   $= \square$

   e $1 - \frac{1}{4} - \frac{1}{2} = \square$

2. Subtract. Express your answers as mixed numbers in their simplest forms.

   a $4 - \frac{1}{9} = \square$

   b $3 - \frac{2}{7} = \square$

   c $5 - \frac{9}{11} = \square$

Workbook B: Practice 2, pages 29–30

Lesson 2

Word Problems

Solving word problems

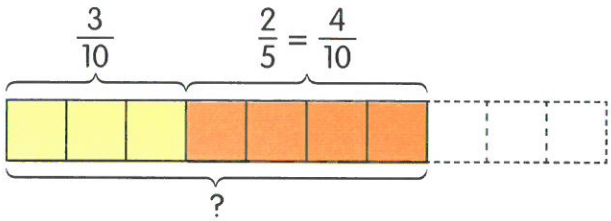
Before you learn ...

Harry had 2 cakes. He ate $\frac{3}{4}$ of a cake.

Use  to show how much cake Harry had left.

Learn

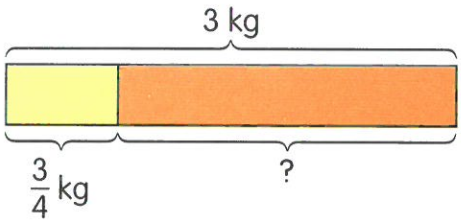
1 Toby ate $\frac{3}{10}$ of a yoghurt bar. Seth ate $\frac{2}{5}$ of the yoghurt bar. What fraction of the yoghurt bar did they eat altogether?



$$\frac{3}{10} + \frac{2}{5} = \frac{3}{10} + \frac{4}{10}$$
$$= \frac{7}{10}$$

They ate $\frac{7}{10}$ of the yoghurt bar altogether.

2 Amy had 3 kg of flour. She used $\frac{3}{4}$ kg of the flour to bake a cake. How much flour did Amy have left?



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

Amy had $2\frac{1}{4}$ kg of flour left.

Take 1 whole from 3.

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

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

3 Hannah bought 2 pizzas. She gave Julian $\frac{4}{9}$ of a pizza and gave Tammy $\frac{1}{3}$ of a pizza.

a How much of a pizza did Hannah give away?

b How many pizzas did Hannah have left?

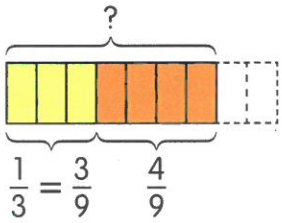
Step 1 What have I gathered from the problem?

Step 2 How do I solve it?
I can draw a model.

Step 3 What do I need to find?
I need to find how much of a pizza Hannah gave away.
Then, I need to find how many pizzas Hannah had left.

What did Hannah buy?
How many pizzas did she buy?
How much of a pizza did Julian get?
How much of a pizza did Tammy get?

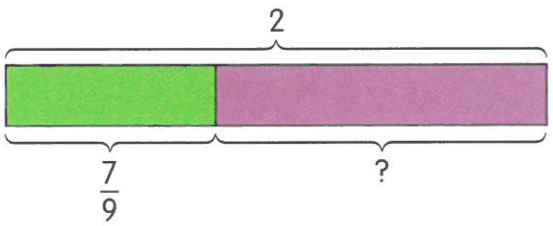
a



$$\frac{4}{9} + \frac{1}{3} = \frac{4}{9} + \frac{3}{9}$$
$$= \frac{7}{9}$$

Hannah gave away $\frac{7}{9}$ of a pizza.

b



$$2 - \frac{7}{9} = 1\frac{2}{9}$$

Hannah had $1\frac{2}{9}$ pizzas left.

Take 1 whole from 2.
$1 - \frac{7}{9} = \frac{2}{9}$
$1 + \frac{2}{9} = 1\frac{2}{9}$

Step 4 How can I check my answer?
I can work backwards to check my answer.

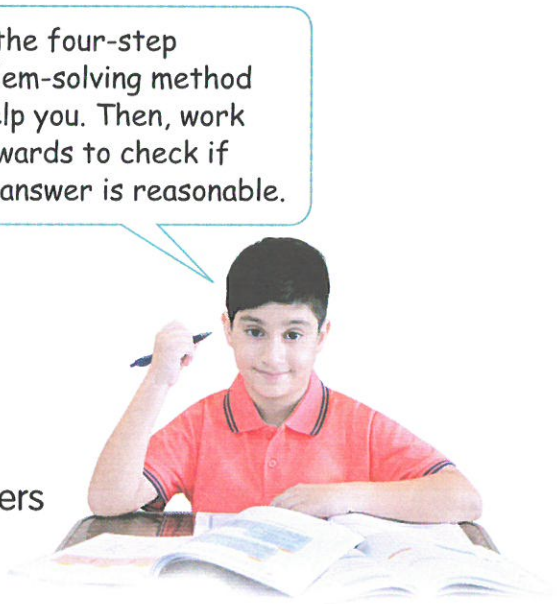
4 A bottle contained $\frac{3}{4}\ \ell$ of water. A pail contained $\frac{1}{8}\ \ell$ more water than the bottle. What was the total amount of water in both containers?

$$\frac{3}{4} + \frac{1}{8} = \frac{6}{8} + \frac{1}{8}$$
$$= \frac{7}{8}$$

The pail contained $\frac{7}{8}\ \ell$ of water.

$$\frac{7}{8} + \frac{3}{4} = \frac{7}{8} + \frac{6}{8}$$
$$= \frac{13}{8}$$
$$= 1\frac{5}{8}$$

The total amount of water in both containers was $1\frac{5}{8}\ \ell$.



5 The total mass of a box and a parcel was $\frac{9}{10}$ kg. The mass of the parcel was $\frac{1}{4}$ kg. How much lighter was the parcel than the box?

$$\frac{9}{10} - \frac{1}{4} = \frac{18}{20} - \frac{5}{20}$$
$$= \frac{13}{20}$$

The mass of the box was $\frac{13}{20}$ kg.

$$\frac{13}{20} - \frac{1}{4} = \frac{13}{20} - \frac{5}{20}$$
$$= \frac{8}{20}$$
$$= \frac{2}{5}$$

The parcel was $\frac{2}{5}$ kg lighter than the box.

Hands-on Activity

Create and solve word problems.

Work in groups.

1. Complete the word problems. You can use the fractions provided.

$\frac{1}{3}$ $\frac{1}{4}$ $\frac{1}{6}$ $\frac{1}{12}$

a. Tom bought 3 pizzas.

Tom ate _____ of a pizza.

What fraction of the pizzas did Tom have left?

b. Jenny cycled $\frac{5}{9}$ km.

Vic cycled _____ km more than Jenny.

Jim cycled _____ km less than Vic.

How far did Jim cycle?

2. Write a word problem with the words and fractions provided.

$\frac{3}{10}$ pie $\frac{2}{5}$ $\frac{1}{10}$ Polly Anna ate Kyle

Example

Kyle ate $\frac{3}{10}$ of a pie.

Polly ate $\frac{2}{5}$ of a pie.

Anna ate $\frac{1}{10}$ more pie than both Kyle and Polly.

How many pie(s) did Anna eat?

3. Ask your classmates to solve the word problems in 1 and 2. Explain the method.

Guided Practice

1. Hafiz ate $\frac{3}{4}$ of a loaf of bread. John ate $\frac{1}{2}$ of a similar loaf of bread. How much more of a loaf of bread did Hafiz eat than John?

   ☐ ○ ☐ = ☐

   Hafiz ate ☐ more of a loaf of bread than John.

2. Terry had to travel 4 km from Town A to Town B. He travelled $\frac{5}{8}$ km by MRT. Then, he walked the rest of the way. How far did he walk?

   ☐ ○ ☐ = ☐

   Terry walked ☐ km.

3. Vin made some fruit punch with $\frac{3}{4}$ ℓ of orange juice and $\frac{2}{5}$ ℓ of mango juice.

   a. What volume of fruit punch did he have? Give your answer as a mixed number in its simplest form.

   b. Vin had 2 ℓ of orange juice at first. How much orange juice did he have left?

   a. ☐ ○ ☐ = ☐

   Vin had ☐ ℓ of fruit punch.

   b. ☐ ○ ☐ = ☐

   Vin had ☐ ℓ of orange juice left.

4 In a cooking competition, Mdm Siti used $\frac{7}{10}$ kg of curry powder. Mdm Nur used $\frac{1}{5}$ kg less curry powder than Mdm Siti. How much curry powder did they use altogether? Give your answer as a mixed number in its simplest form.

[ ] [ ] [ ] = [ ]

Mdm Nur used [ ] kg of curry powder.

[ ] [ ] [ ] = [ ]

They used [ ] kg of curry powder altogether.

5 The total mass of a book and a water bottle was $\frac{4}{5}$ kg. The mass of the water bottle was $\frac{1}{2}$ kg. How much heavier was the water bottle than the book?

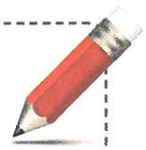
[ ] [ ] [ ] = [ ]

The mass of the book was [ ] kg.

[ ] [ ] [ ] = [ ]

The water bottle was [ ] kg heavier than the book.

Workbook B: Practice 3, pages 31–36



Chapter 9 Review

1. Add $\frac{4}{5}$ and $\frac{3}{10}$.

2. Subtract $\frac{11}{12}$ from 3.

3. Add. Express your answers as mixed numbers in their simplest forms.

   a) $\frac{5}{6} + \frac{2}{3} =$

   b) $\frac{5}{8} + \frac{5}{6} =$

   c) $\frac{1}{6} + \frac{1}{2} + \frac{5}{6} =$

   d) $\frac{2}{3} + \frac{3}{12} + \frac{5}{12} =$

4. Subtract. Express your answers in their simplest forms.

   a) $\frac{5}{7} - \frac{1}{3} =$

   b) $\frac{7}{8} - \frac{1}{4} - \frac{3}{8} =$

   c) $1 - \frac{3}{8} - \frac{1}{4} =$

   d) $4 - \frac{1}{6} =$

5. Rose spent $\frac{1}{5}$ h cleaning the table and $\frac{3}{10}$ h washing the dishes. After she had finished her housework, Rose spent $\frac{4}{5}$ h reading a book.

   a) How much time did she spend on her housework?

   b) How much more time did Rose spend on reading than on her housework?

6 Qishan barbecued $\frac{3}{4}$ kg of chicken wings. She deep-fried $\frac{1}{8}$ kg fewer chicken wings than she barbecued. What was the total amount of chicken wings that she cooked? Express your answer as a mixed number in its simplest form.

Workbook B:
Chapter 9 Review, pages 37–43
Maths Journal, page 44

Put on Your Thinking Cap!

1 Fill in the boxes with the digits 2, 3, 4 and 5 so that the equation is correct.

$$\frac{\square}{\square} - \frac{\square}{\square} = \frac{7}{12}$$

2 Find the value of $\frac{1}{10} + \frac{1}{5} + \frac{3}{10} + \frac{2}{5} + \frac{1}{2} + \frac{3}{5} + \frac{7}{10} + \frac{4}{5} + \frac{9}{10}$.

Hint: Add two fractions to make 1 whole.

Workbook B:
Put on Your Thinking Cap! pages 45–46
Review 4, pages 47–50

CHAPTER 10

Decimals

Lessons

1. Understanding Tenths
2. Understanding Hundredths
3. Understanding Thousandths
4. Comparing and Ordering Decimals
5. Rounding Decimals
6. Fractions and Decimals

Big Idea

Decimals are fractions in another form.

Lesson 1

Understanding Tenths

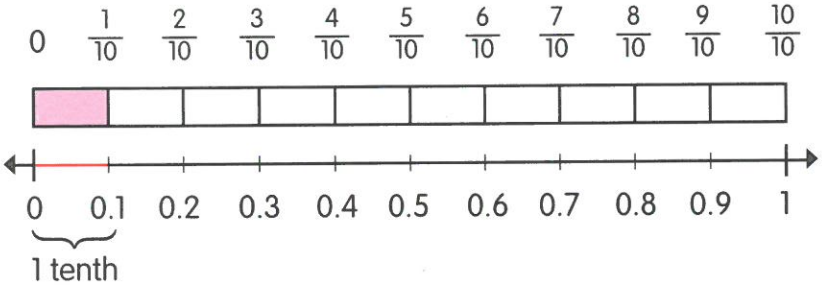
Expressing tenths as decimals

Before you learn ...

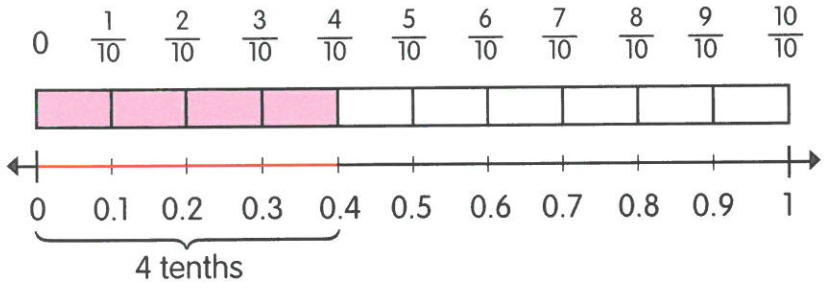
Fold a strip of paper into 10 equal parts. Mark the parts and colour 1 part.
What fraction of the strip is coloured? Can you write the fraction in another way?

Learn

1 Ben divides a strip of paper into 10 equal parts.



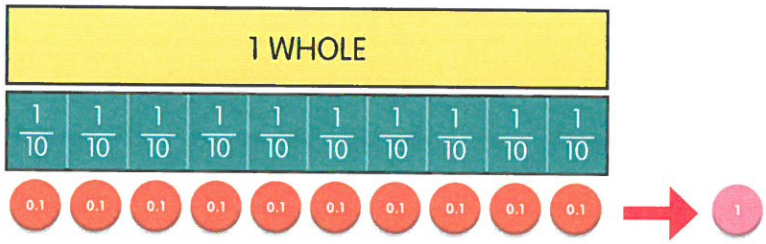
We write 1 tenth as $\frac{1}{10}$ or 0.1. — We read 0.1 as **zero point one**.



We write 4 tenths as $\frac{4}{10}$ or 0.4. — We read 0.4 as **zero point four**.

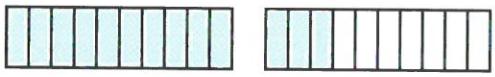
0.1 and 0.4 are decimals.

2 You can exchange 1 one for 10 tenths.



1 one = 10 tenths

3 Express 13 tenths as a decimal.

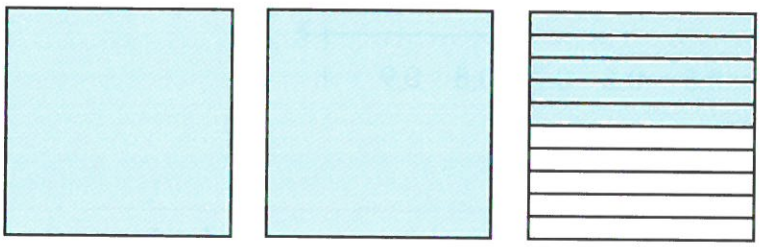


13 tenths

1 one 3 tenths $= 1\frac{3}{10}$

$= 1.3$ — We read 1.3 as **one point three**.

4 Express $2\frac{5}{10}$ as a decimal.



2 ones 5 tenths $= 2\frac{5}{10}$

$= 2.5$ — We read 2.5 as **two point five**.

5 Represent 2.8 on  .

Ones	Tenths
2	8

stands for 2 ones

stands for 8 tenths

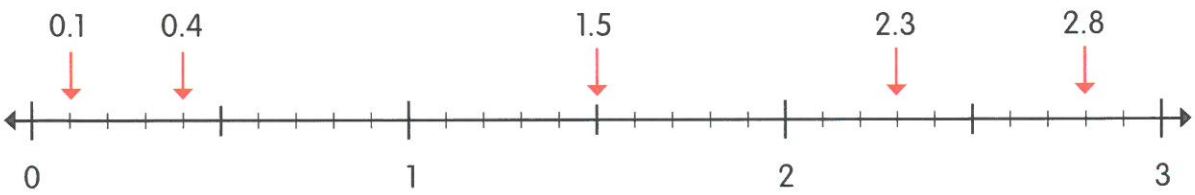
2.8 = 2 + 0.8

The value of the digit 2 is 2.
The digit 2 is in the ones place.

The value of the digit 8 is 0.8.
The digit 8 is in the tenths place.

2 ones 8 tenths = 2.8
2.8 has 1 decimal place.

6 Tenths can be represented on  .



Hands-on Activity

Work in pairs.
Use 10 1 0.1 0.01 0.001 and .

Station 1 Represent decimals on .

1. Express $\frac{2}{10}$ as a decimal and represent the decimal using 10 1 0.1 0.01 0.001 on .

2. Repeat 1 with the following.

   a $\frac{7}{10}$ b $1\frac{9}{10}$

Station 2 Count in tenths using 10 1 0.1 0.01 0.001.

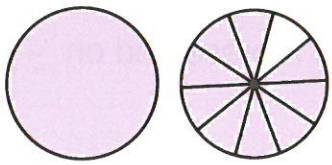
1. Use 0.1 to show these decimals. Count in tenths.

   a 0.5 b 0.9 c 1.2

Guided Practice

1. What decimals do the following shaded parts represent?

   a 

   b 

2. Express the following as a decimal.

   $2\frac{3}{10} =$ ☐

3 Express each of the following as a decimal.

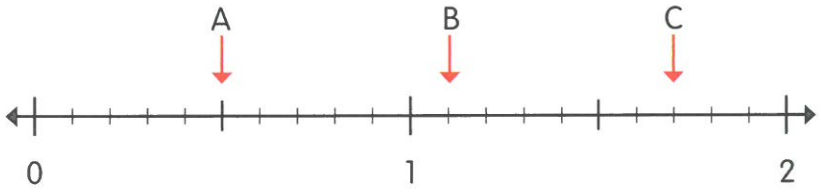
a 14 tenths = ____

b 18 tenths = ____

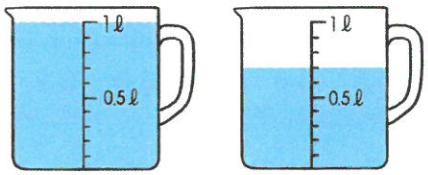
c $\frac{5}{10}$ = ____

d $2\frac{6}{10}$ = ____

4 What decimals do the letters represent on the number line?



5 Express the total volume of water as a mixed number and a decimal.



Total volume of water = $1\frac{\square}{\square}$ ℓ

= ____ ℓ

6 Find the missing numbers.

a In 23.6, the digit ____ is in the tens place.

b In 95.4, the value of the digit 4 is ____.

c In 80.7, the value of the digit 8 is ____.

d In 52.3, the digit ____ is in the tenths place.

7 Find the missing numbers.

a 9 + 0.8 = ____

b 18.7 = 10 + ____ + 0.7

c ____ + 2 + 0.4 = 12.4

d 37.6 = 30 + 7 + ____

Workbook B: Practice 1, pages 51–52

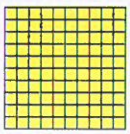
Lesson 2

Understanding Hundredths

Expressing hundredths as decimals

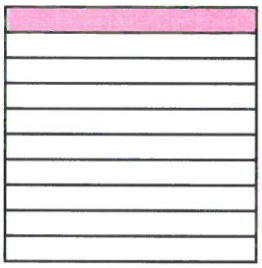
Before you learn ...

Look at the hundred square grid.
Express 1 small square as a fraction of the whole.
Can you write the fraction in another way?



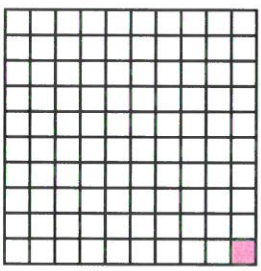
Learn

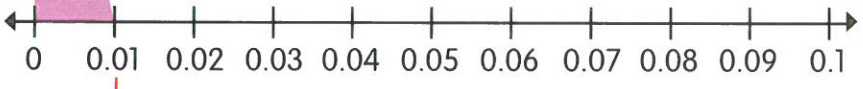
1 Divide a square into 10 equal parts.



$\frac{1}{10}$ (1 tenth)

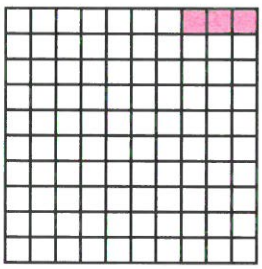
Divide a square into 100 equal parts.





$\frac{1}{100}$ (1 hundredth)

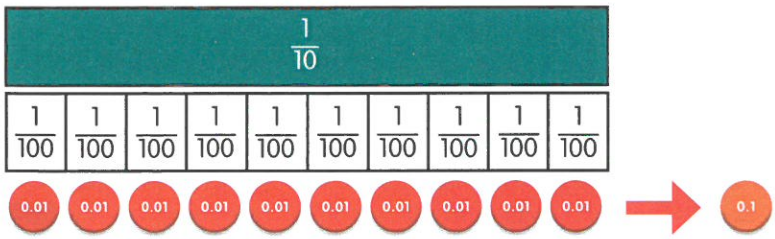
We write 1 hundredth as $\frac{1}{100}$ or 0.01. — We read 0.01 as **zero point zero one**.



$\frac{3}{100}$ (3 hundredths)

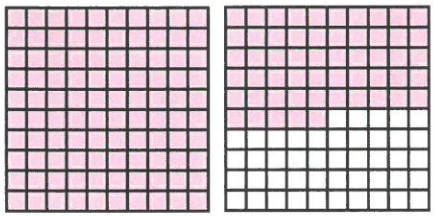
We write 3 hundredths as $\frac{3}{100}$ or 0.03. — We read 0.03 as **zero point zero three**.

2 You can exchange 1 tenth for 10 hundredths.

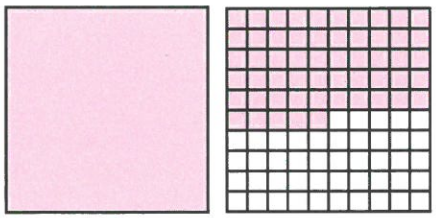


1 tenth = 10 hundredths

3 Express 155 hundredths as a decimal.



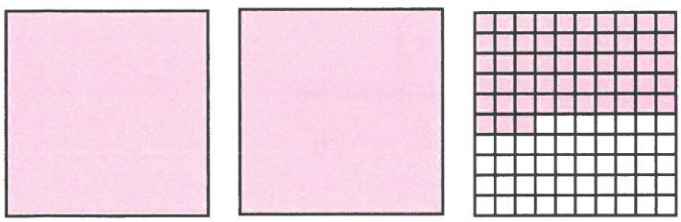
155 hundredths



1 one 55 hundredths $= 1\frac{55}{100}$

$= 1.55$ — We read 1.55 as **one point five five**.

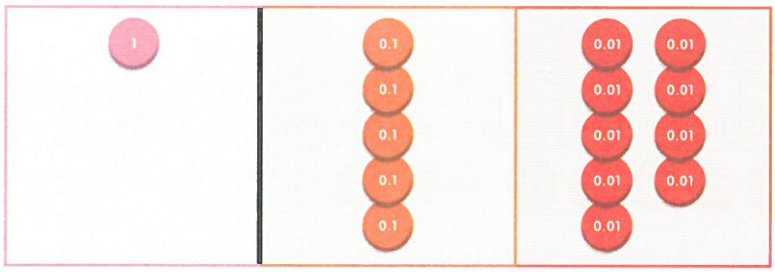
4 Express $2\frac{53}{100}$ as a decimal.



2 ones 53 hundredths $= 2\frac{53}{100}$

$= 2.53$ — We read 2.53 as **two point five three**.

5 Represent 1.59 on .



1 one 5 tenths 9 hundredths
= 1.59
1.59 has 2 decimal places.

Ones	Tenths	Hundredths
1	5	9
stands for 1 one	stands for 5 tenths	stands for 9 hundredths

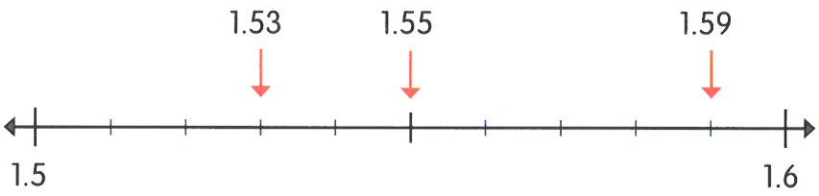
$1.59 = 1 + 0.5 + 0.09$

The value of the digit 1 is 1.
The digit 1 is in the ones place.

The value of the digit 5 is 0.5.
The digit 5 is in the tenths place.

The value of the digit 9 is 0.09.
The digit 9 is in the hundredths place.

6 Hundredths can be represented on .



Hands-on Activity

Work in pairs.

Station 1 Record measurements in decimals.

Use  .

1. Record the measurements in decimals (up to 2 decimal places).
   - a. the height of your partner, in metres.
   - b. the mass of ten mathematics textbook, in kilograms.
   - c. the volume of water in a pail, in litres.

2. Write the measurements on  .

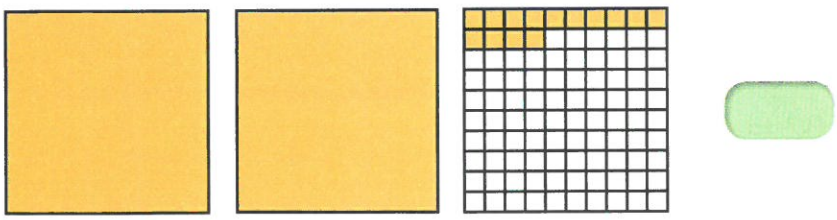
Station 2 Count in hundredths using 10 1 0.1 0.01 0.001.

Use 10 1 0.1 0.01 0.001.

1. Use 0.01 to show these decimals. Count in hundredths.
   - a. 0.03
   - b. 0.08
   - c. 0.15

Guided Practice

1. What decimal do the following shaded parts represent?



2. Express the following as a decimal.

3 Express each of the following as a decimal.

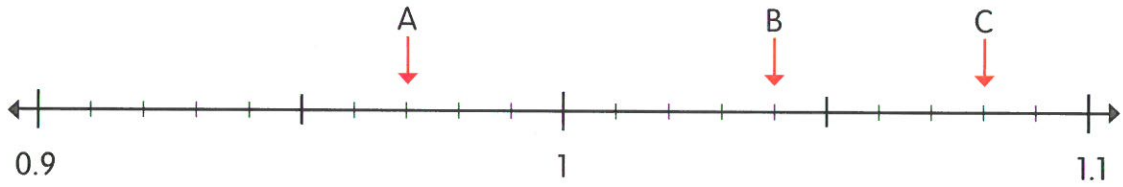
(a) 7 hundredths = ____

(b) 148 hundredths = ____

(c) $\frac{26}{100}$ = ____

(d) $2\frac{4}{100}$ = ____

4 What decimals do the letters represent on the number line?



5 In 5.39,

(a) the digit ____ is in the ones place.

(b) the digit ____ is in the tenths place.

(c) the digit ____ is in the hundredths place.

6 In 3.47,

(a) the value of the digit 3 is ____.

(b) the value of the digit 4 is ____.

(c) the value of the digit 7 is ____.

7 Find the missing numbers.

(a) 7 + 0.8 + 0.02 = ____

(b) 10 + 5 + 0.7 + ____ = 15.71

(c) 34.09 = 30 + 4 + ____

Using decimals to write dollars and cents

Before you learn ...

Lisa has 10 dollars and 85 cents.
Express the amount she has as a decimal.

Learn

1 We can write money as decimals.

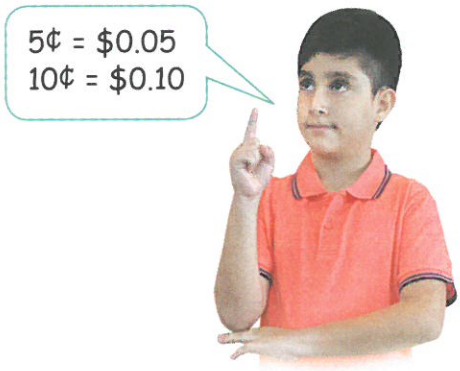
a

$1.00 ten 10¢ or 100¢

b

$1 4 . 8 5

$10.00 $4.00 $0.80 $0.05



Guided Practice

1 Express each amount in dollars.

a 30¢ = $ **b** 65¢ = $ **c** 120¢ = $

2 Express each amount in decimal form.

a 5 dollars 20 cents = $

b 7 dollars 45 cents = $

c 18 dollars = $

d 33 dollars 5 cents = $

Workbook B: Practice 2, pages 53–54

Lesson 3

Understanding Thousandths

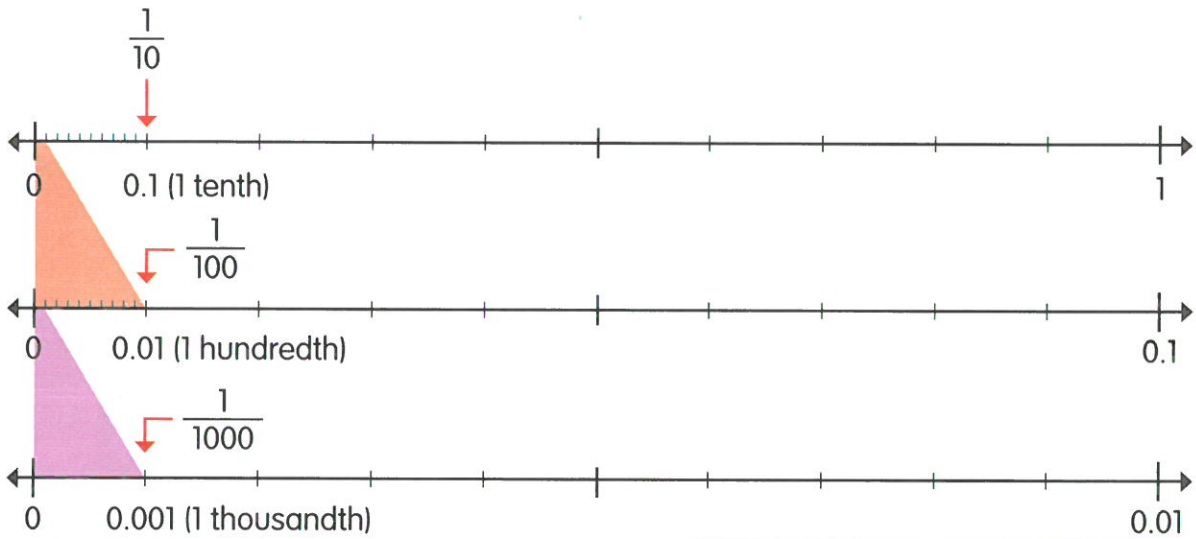
Expressing thousandths as decimals

Before you learn ...

Look at the decimal square chart that has been provided by your teacher.
Express 1 small rectangle as a fraction of the whole.
Can you write the fraction in another way?

Learn

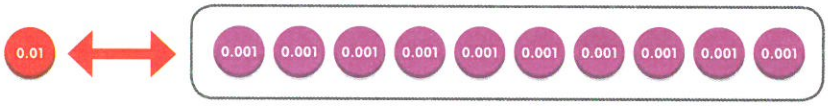
1



We write 1 thousandth as $\frac{1}{1000}$ or 0.001. — We read 0.001 as **zero point zero zero one**.

We write 2 thousandths as $\frac{2}{1000}$ or 0.002. — We read 0.002 as **zero point zero zero two**.

2 You can exchange 1 hundredth for 10 thousandths.



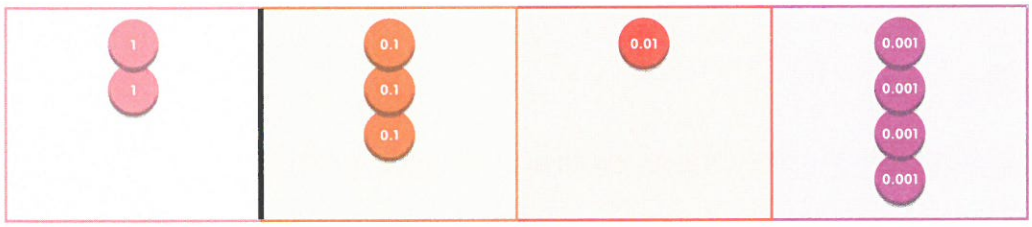
1 hundredth = 10 thousandths

3 Express $2\frac{314}{1000}$ as a decimal.

$2\frac{314}{1000} = 2.314$

$\frac{314}{1000}$ = 314 thousandths
= 3 tenths
1 hundredth
4 thousandths

4 Represent 2.314 on .



Ones	Tenths	Hundredths	Thousandths
2	3	1	4
stands for 2 ones	stands for 3 tenths	stands for 1 hundredth	stands for 4 thousandths

$2.314 = 2 + 0.3 + 0.01 + 0.004$

The value of the digit 2 is 2.
The digit 2 is in the ones place.

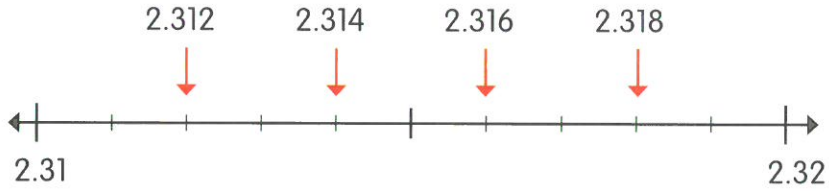
The value of the digit 3 is 0.3.
The digit 3 is in the tenths place.

The value of the digit 1 is 0.01.
The digit 1 is in the hundredths place.

The value of the digit 4 is 0.004.
The digit 4 is in the thousandths place.

2.314 = 2 ones 3 tenths 1 hundredth 4 thousandths
$= (2 \times 1) + (3 \times 0.1) + (1 \times 0.01) + (4 \times 0.001)$
$= 2 + 0.3 + 0.01 + 0.004$

5 Thousandths can be represented on .



Hands-on Activity

Show the value of each digit in decimals.

Work in pairs.

Use 10 1 0.1 0.01 0.001 and .

1 Using 10 1 0.1 0.01 0.001, show these decimals to your partner.

a 6.3 b 7.64 c 0.562 d 3.986

2 Your partner writes the decimals on .

3 Find the value of the digit 6 in the decimals in 1.

Guided Practice

1 Express each of the following as a decimal.

a 0.1 0.001 0.001 $\frac{102}{1000} =$ ☐

b 1 0.01 0.01 0.001 $1\frac{21}{1000} =$ ☐

2 Express each of the following as a decimal.

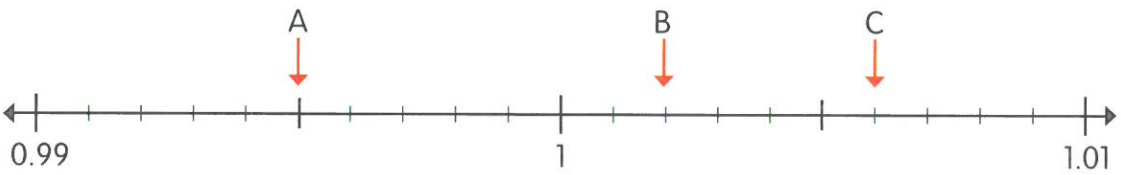
a 627 thousandths = ☐

b $\frac{5}{1000} =$ ☐

c $\frac{972}{1000} =$ ☐

d $5\frac{715}{1000} =$ ☐

3 What decimals do the letters represent on the number line?



4 In 2.315,

a the digit ____ is in the ones place.

b the digit ____ is in the tenths place.

c the digit ____ is in the hundredths place.

d the digit ____ is in the thousandths place.

5 In 4.072,

a the value of the digit 4 is ____.

b the value of the digit 0 is ____.

c the value of the digit 7 is ____.

d the value of the digit 2 is ____.

6 Find the missing numbers.

a $5 + 0.3 + 0.07 + 0.004 =$ ____

b $6 + 0.4 + 0.08 +$ ____ $= 6.481$

c $2.637 = 2 +$ ____ $+ 0.03 + 0.007$

d $1.053 = 1 +$ ____ $+ 0.003$

Maths Sharing

Understand decimals.

1 Look at the following decimals.

a 0.2 b 0.20 c 0.200

2 Use  or  to explain why the decimals in 1 are the same.

Workbook B: Practice 3, pages 55–56

Lesson 4

Comparing and Ordering Decimals

Comparing and ordering decimals

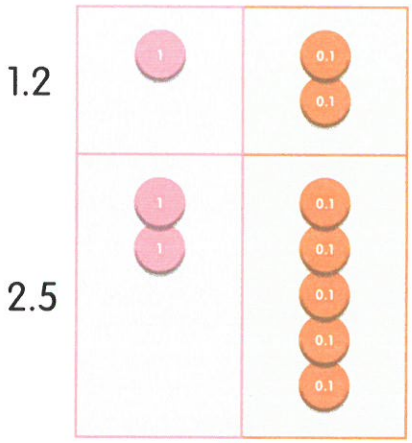
Before you learn ...

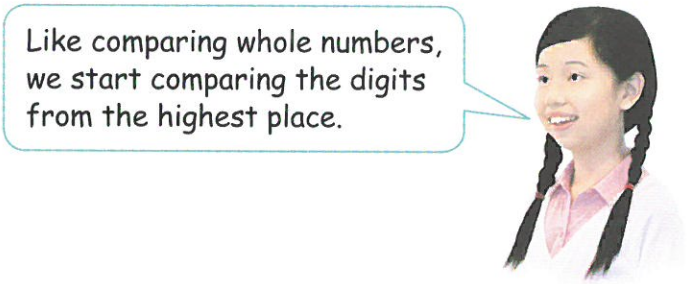
Draw a line 8.5 cm long. Draw another line 6.5 cm long. Which line is longer?

Learn

Compare decimals up to 1 decimal place using

1 Which is greater, 1.2 or 2.5?





Ones	Tenths
1	2
2	5

Compare the ones.
2 ones is greater than 1 one.

So, 2.5 is greater than 1.2.

Compare decimals up to 2 decimal places using  and 

2 Which is smaller, 2.3 or 2.24?

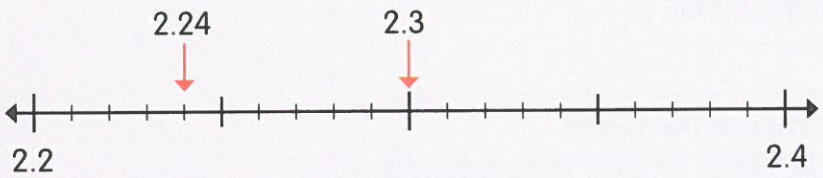
Method 1

Ones	Tenths	Hundredths
2	3	
2	2	4

Compare the ones. They are the same.

Compare the tenths. **2** tenths is smaller than **3** tenths.

Method 2



So, 2.24 is smaller than 2.3.

Compare decimals up to 3 decimal places using  and 

3 Which is greater, 1.143 or 1.135?

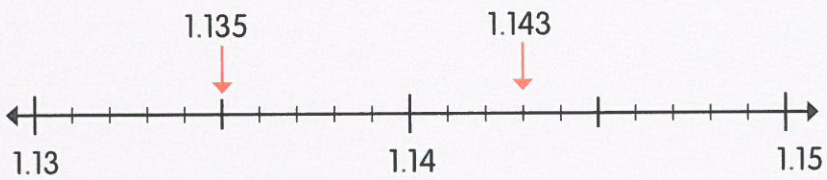
Method 1

Ones	Tenths	Hundredths	Thousandths
1	1	4	3
1	1	3	5

The ones and tenths are equal.

Compare the hundredths. **4** hundredths is greater than **3** hundredths.

Method 2



So, 1.143 is greater than 1.135.

Order decimals

4 Arrange 0.62, 0.263 and 0.6 in increasing order.

Ones	Tenths	Hundredths	Thousandths
0	6	2	0
0	2	6	3
0	6	0	0

Step 1 Compare the ones.
They are the same.

Step 2 Compare the tenths.
2 tenths is smaller than **6** tenths.
So, 0.263 is the smallest.

Step 3 Compare the hundredths of the remaining numbers 0.62 and 0.6.
2 hundredths is greater than **0** hundredths.
0.62 is greater than 0.6.
So, 0.62 is the greatest.

In increasing order, the decimals are 0.263, 0.6, 0.62.

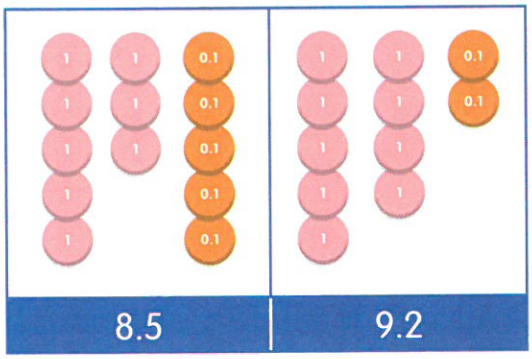
Hands-on Activity

Work in pairs.
Use 10 1 0.1 0.01 0.001 and .

Station 1 Compare decimals using and 10 1 0.1 0.01 0.001.

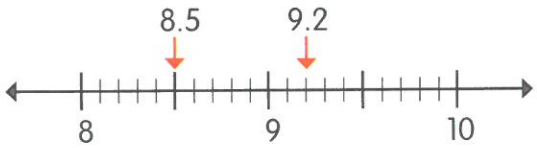
1 Show 8.5 and 9.2 using 10 1 0.1 0.01 0.001.

Example



2 Your partner fills up to compare the decimals and says which decimal is greater or smaller.

Example



3 Switch roles. Repeat **1** and **2** with these decimals.

(a) 4.6 and 3.9

(b) 13.18 and 13.47

(c) 2.137 and 2.17

(d) 8.049 and 8.042

Station 2 Use  to describe, compare and order decimals.

1. Show these decimals using  .

   a) 2.654 b) 2.648 c) 2.659

2. Describe the decimals using **greater than**, **smaller than**, **greatest**, **smallest** or **the same as**.

3. Arrange the decimals in decreasing order.

4. Repeat 1 to 3 with these decimals.

   a) 1.054, 1.4, 1.062, 2 b) 4.318, 4.419, 4.315

Guided Practice

1. Which decimal is greater?

   a) 23.4 22.9 b) 1.65 1.8

   c) 8.217 8.235 d) 0.012 0.12

2. Which decimal is smaller?

   a) 11.6 12.6 b) 4.24 4.218

   c) 6.423 6.427 d) 0.303 0.33

3. Which decimal is the greatest?

   0.58 0.542 0.61 0.061

4. Which decimal is the smallest?

   2.074 2.74 2.407 2.47

5. Arrange 0.18, 0.2 and 0.185 in increasing order.

6. Arrange 0.345, $\frac{1}{2}$ and 0.45 in decreasing order.

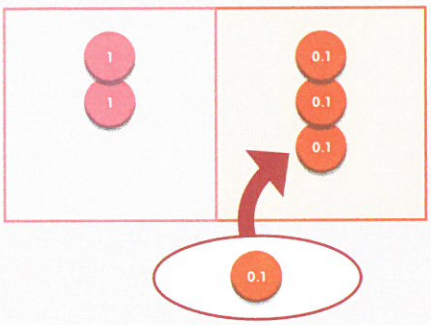
Finding missing numbers in a number pattern

Before you learn ...

Look at the number pattern.
2.1, 2.3, 2.5, 2.7, ?, ?
Explain how to find the next two numbers.

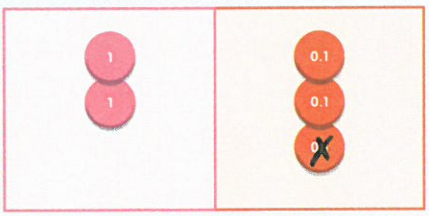
Learn

1 **a** What is 0.1 more than 2.3?



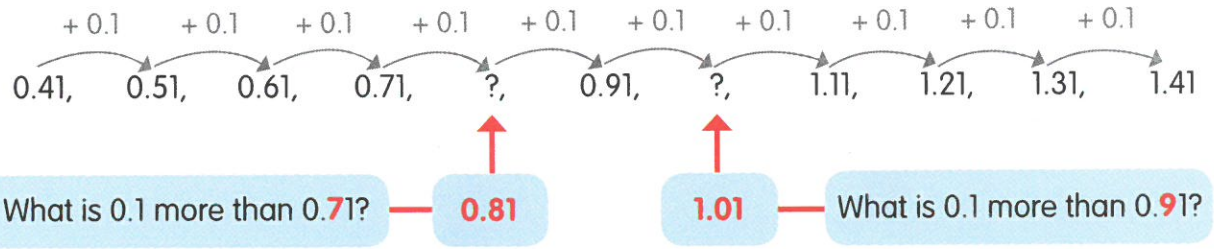
0.1 more than 2.**3** is 2.**4**.

b What is 0.1 less than 2.3?

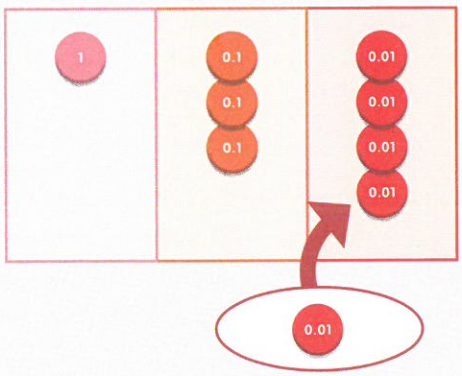


0.1 less than 2.**3** is 2.**2**.

2 Complete the number pattern.

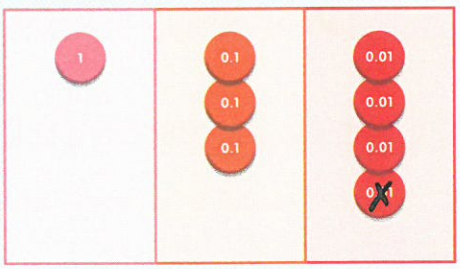


3 **a** What is 0.01 more than 1.34?



0.01 more than 1.3**4** is 1.3**5**.

b What is 0.01 less than 1.34?



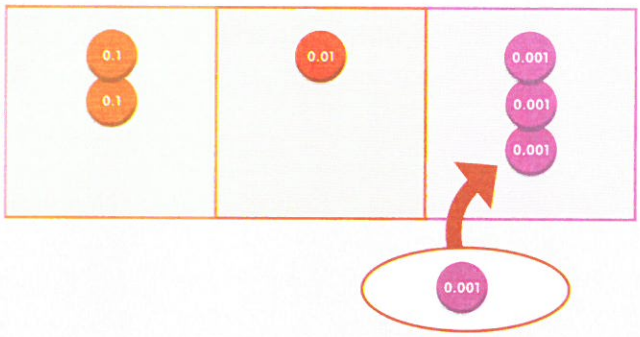
0.01 less than 1.3**4** is 1.3**3**.

4 Complete the number pattern.

What is 0.01 less than 5.412? — **5.402**

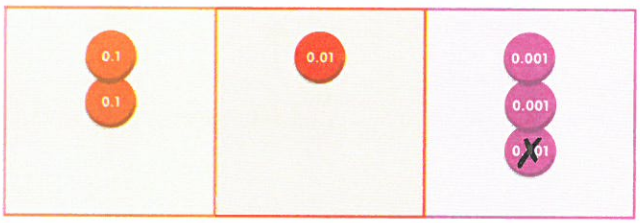
5.382 — What is 0.01 less than 5.392?

5 **a** What is 0.001 more than 0.213?



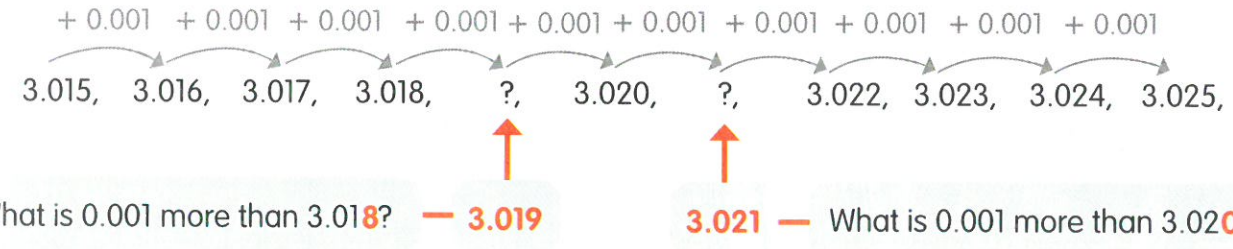
0.001 more than 0.21**3** is 0.21**4**.

b What is 0.001 less than 0.213?



0.001 less than 0.21**3** is 0.21**2**.

6 Complete the number pattern.



What is 0.001 more than 3.018? — **3.019**

3.021 — What is 0.001 more than 3.020?

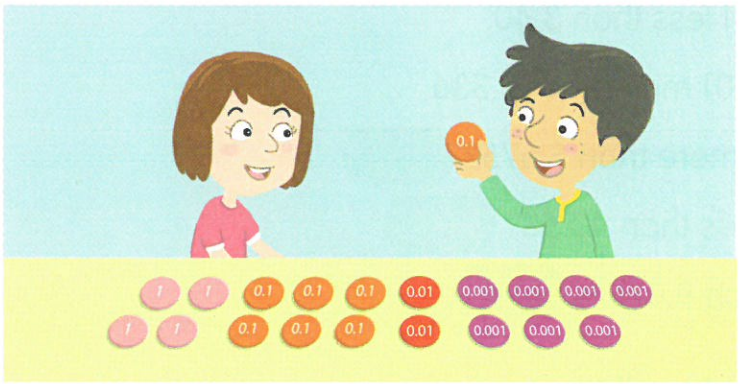
Hands-on Activity

Work in pairs.

Station 1 Represent a decimal more than or less than a given decimal.

Use 10 1 0.1 0.01 0.001.

1. Show 4.627 with 10 1 0.1 0.01 0.001 to your partner.
2. Your partner uses 10 1 0.1 0.01 0.001 to show his/her answers to these questions.
   - a. 0.1 more than the decimal
   - b. 0.1 less than the decimal
   - c. 0.01 more than the decimal
   - d. 0.01 less than the decimal
   - e. 0.001 more than the decimal
   - f. 0.001 less than the decimal



3. Switch roles. Repeat 1 and 2 with these decimals.
   - a. 3.185
   - b. 6.892
   - c. 1.947

Station 2 Form and continue number patterns.

1. Arrange the following decimals in order to create a number pattern.
   0.8 1.2 0.4 1.6
2. Your partner describes the number pattern and writes the next three numbers in the pattern.
3. Switch roles. Repeat 1 and 2 with the following sets of decimals.
   - a. 0.3 1.2 0.9 0.6
   - b. 5.17 5.12 5.22 5.07
   - c. 1.006 1.010 1.004 1.008

Guided Practice

1 a What is 0.1 more than 1.206? ____

b What is 0.01 more than 1.206? ____

c What is 0.001 more than 1.206? ____

2 a What is 0.1 less than 4.052? ____

b What is 0.01 less than 4.052? ____

c What is 0.001 less than 4.052? ____

3 a ____ is 0.1 more than 23.3.

b ____ is 0.01 less than 3.40.

c ____ is 0.001 more than 0.336.

d What is 0.01 more than 5.675? ____

e What is 0.1 less than 40.58? ____

f 0.001 less than 9.076 is ____.

4 Complete the number patterns.

a 0.1, 0.3, 0.5, 0.7, 0.9, ____

b 13.9, 13.8, 13.7, 13.6, 13.5, ____

c 1.10, 1.12, 1.14, 1.16, 1.18, ____

d 5.287, 5.267, 5.247, ____, 5.207, 5.187

e 9.909, 9.908, ____, 9.906, 9.905, 9.904

f ____, 0.128, 0.132, 0.136, 0.14, 0.144

Workbook B: Practice 4, pages 57–60

Lesson 5

Rounding Decimals

Rounding a decimal

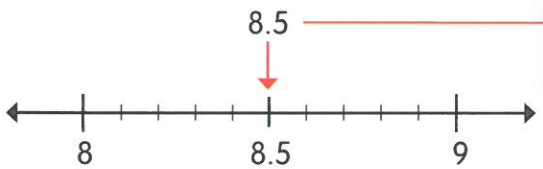
Before you learn ...

Munah says 22.6 is 22 when rounded to the nearest whole number.
Use  to explain if she is correct.

Learn

Round a decimal to the nearest whole number

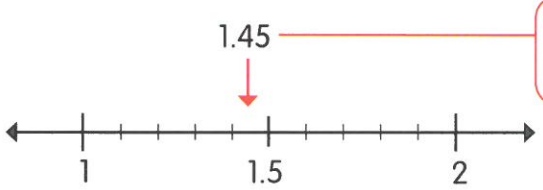
1 Round 8.5 to the nearest whole number.



8.5 is exactly halfway between 8 and 9.

8.5 is 9 when rounded to the nearest whole number.
8.5 ≈ 9

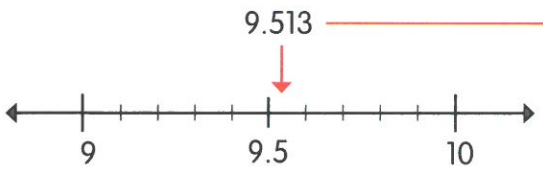
2 Carina is 1.45 m tall.
Round 1.45 m to the nearest metre.



1.45 is between 1 and 2. It is nearer to 1 than to 2.

1.45 m is 1 m when rounded to the nearest metre.
1.45 m ≈ 1 m

3 Round 9.513 to the nearest whole number.

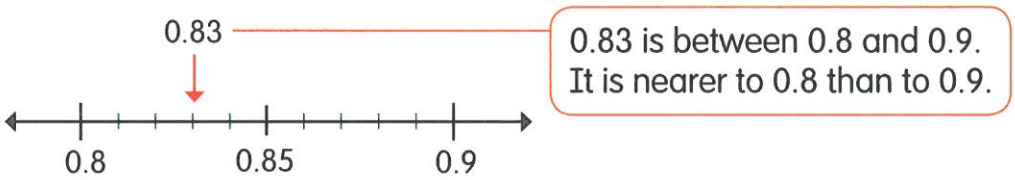


9.513 is between 9 and 10. It is nearer to 10 than to 9.

9.513 is 10 when rounded to the nearest whole number.
9.513 ≈ 10

Round a decimal to 1 decimal place

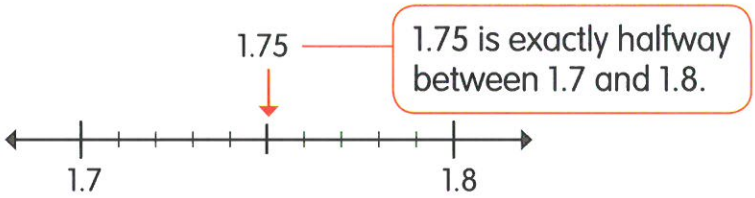
4 A cup contains 0.83 ℓ of water. Round 0.83 ℓ to 1 decimal place.



0.83 is between 0.8 and 0.9.
It is nearer to 0.8 than to 0.9.

0.83 ℓ is 0.8 ℓ when rounded to 1 decimal place.
0.83 $\ell \approx$ 0.8 ℓ

5 Round 1.75 to the nearest tenth.

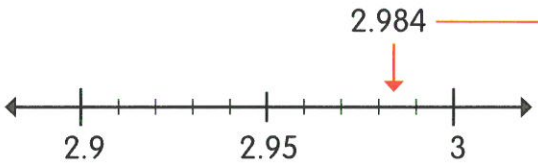


1.75 is exactly halfway between 1.7 and 1.8.

Rounding to the nearest tenth is the same as rounding to 1 decimal place.

1.75 is 1.8 when rounded to the nearest tenth.
1.75 $\approx$ 1.8

6 Round 2.984 to 1 decimal place.



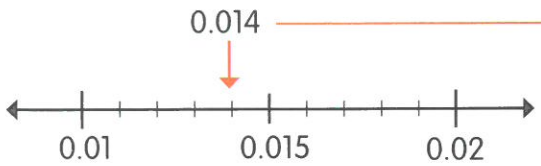
2.984 is between 2.9 and 3.
It is nearer to 3 than to 2.9.

2.984 is 3.0 when rounded to 1 decimal place.

2.984 $\approx$ 3.0 ← 3 is written as 3.0 to 1 decimal place.

Round a decimal to 2 decimal places

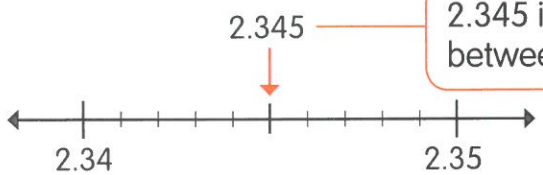
7 A sheet of plastic is 0.014 cm thick. Round 0.014 cm to 2 decimal places.



0.014 is between 0.01 and 0.02.
It is nearer to 0.01 than to 0.02.

0.014 cm is 0.01 cm when rounded to 2 decimal places.
0.014 cm ≈ 0.01 cm

8 Round 2.345 to the nearest hundredth.



2.345 is exactly halfway between 2.34 and 2.35.

2.345 is 2.35 when rounded to the nearest hundredth.
2.345 ≈ 2.35

Rounding to the nearest hundredth is the same as rounding to 2 decimal places.

9 Round 5.997 to 2 decimal places.

5.997 is between 5.99 and 6.00.
It is nearer to 6.00 than to 5.99.

5.997 is 6.00 when rounded to 2 decimal places.
5.997 ≈ 6.00

6 is written as 6.00 to 2 decimal places.

Hands-on Activity

Use  to round decimals.

1. Use three  .
   Fill in the number lines and use arrows to show where to place each of the following decimals.

   (a) 3.4 (b) 2.26 (c) 6.457

2. Answer the following questions.

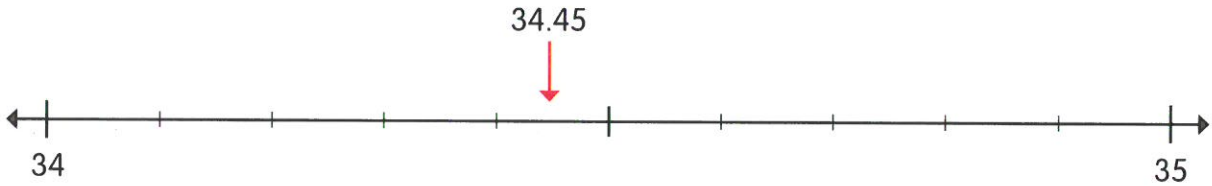
   (a) Round 3.4 to the nearest whole number.

   (b) Round 2.26 to 1 decimal place.

   (c) Round 6.457 to 2 decimal places.

Guided Practice

1. Round 34.45 to the nearest whole number.



34.45 is between _____ and 35.

34.45 is nearer to _____ than to _____.

34.45 is _____ when rounded to the nearest whole number.

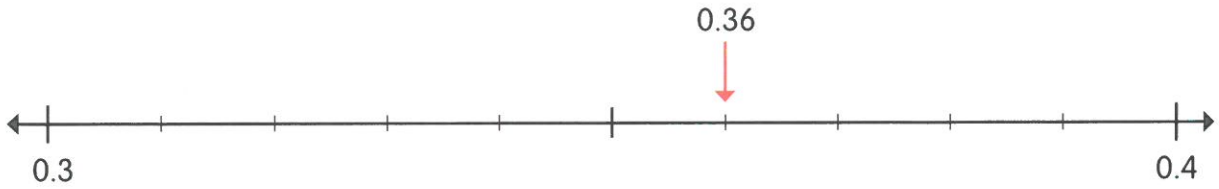
2. Round the following decimals to the nearest whole number.

   (a) 0.7 _____ (b) 4.3 _____

   (c) 41.5 _____ (d) 23.04 _____

   (e) 9.098 _____ (f) 99.826 _____

3 Round 0.36 to 1 decimal place.



0.36 is between 0.3 and ____.

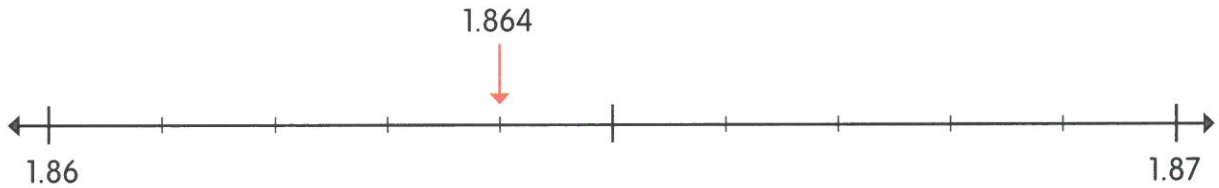
0.36 is nearer to ____ than to ____.

0.36 is ____ when rounded to 1 decimal place.

4 Round the following decimals to 1 decimal place.

a	5.26		b	4.83	
c	12.15		d	15.04	
e	3.456		f	9.982	

5 Round 1.864 to 2 decimal places.



1.864 is between 1.86 and ____.

1.864 is nearer to ____ than to ____.

1.864 is ____ when rounded to 2 decimal places.

6 Round the following decimals to 2 decimal places.

a	2.159		b	0.516	
c	6.782		d	1.945	
e	4.608		f	8.995	

Workbook B: Practice 5, pages 61–62

Lesson 6

Fractions and Decimals

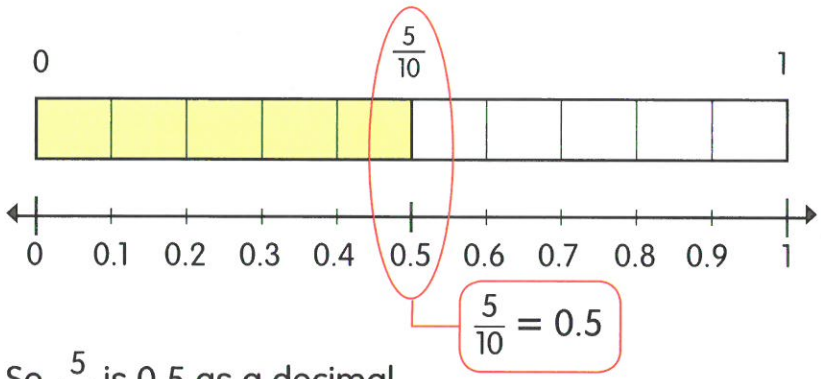
Converting a fraction to a decimal

Before you learn ...

Express $\frac{3}{5}$ m as a decimal.

Learn

1 Express the fraction $\frac{5}{10}$ as a decimal.



So, $\frac{5}{10}$ is 0.5 as a decimal.

2 Express $3\frac{4}{5}$ as a decimal.

$3\frac{4}{5} = 3\frac{8}{10}$

$= 3.8$

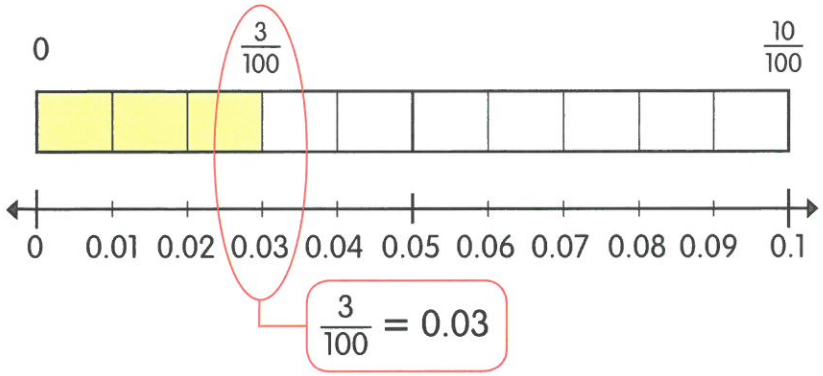
So, $3\frac{4}{5}$ is 3.8 as a decimal.

To convert a fraction to a decimal, first find the equivalent fraction with a denominator of 10 or 100.

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

$= 0.8$

3 Express $\frac{3}{100}$ as a decimal.



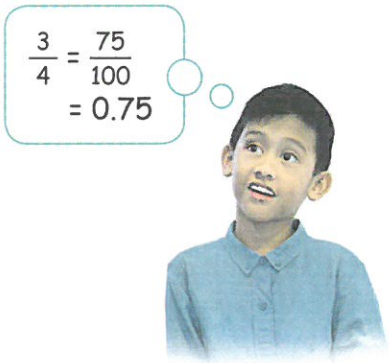
So, $\frac{3}{100}$ is 0.03 as a decimal.

4 Express $1\frac{3}{4}$ as a decimal.

$1\frac{3}{4} = 1\frac{75}{100}$

$= 1.75$

So, $1\frac{3}{4}$ is 1.75 as a decimal.



Guided Practice

1 Express each fraction as a decimal.

a $\frac{3}{5}$ ____

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

c $6\frac{1}{4}$ ____

d $5\frac{27}{50}$ ____

e $3\frac{4}{25}$ ____

f $7\frac{6}{20}$ ____

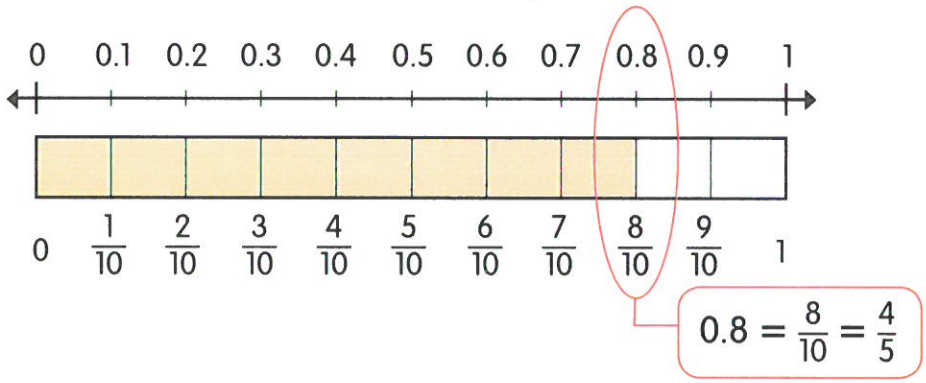
Converting a decimal to a fraction

Before you learn ...

Sarah cycles 2.85 km to school every day. Express the distance as a fraction.

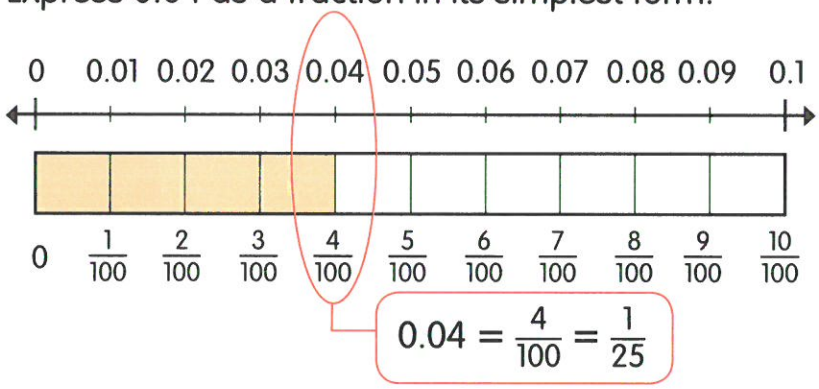
Learn

1 Express 0.8 as a fraction in its simplest form.



0.8 is $\frac{4}{5}$ as a fraction in its simplest form.

2 Express 0.04 as a fraction in its simplest form.



0.04 is $\frac{1}{25}$ as a fraction in its simplest form.

3 Express each decimal as a mixed number in its simplest form.

a $6.5 = 6\frac{5}{10}$

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

b $7.25 = 7\frac{25}{100}$

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

Guided Practice

1 Express each decimal as a fraction or a mixed number in its simplest form.

(a) 0.4 ☐

(b) 0.6 ☐

(c) 2.8 ☐

(d) 8.2 ☐

(e) 3.75 ☐

(f) 2.35 ☐

(g) 2.25 ☐

(h) 4.15 ☐

(i) 6.72 ☐

Workbook B: Practice 6, pages 63–64

Chapter 10 Review

1 Express each of the following as a decimal.

(a) $1\frac{8}{10}$ = ☐

(b) 3 tenths = ☐

(c) $2\frac{38}{100}$ = ☐

(d) 7 hundredths = ☐

(e) $4\frac{2}{1000}$ = ☐

(f) 6 thousandths = ☐

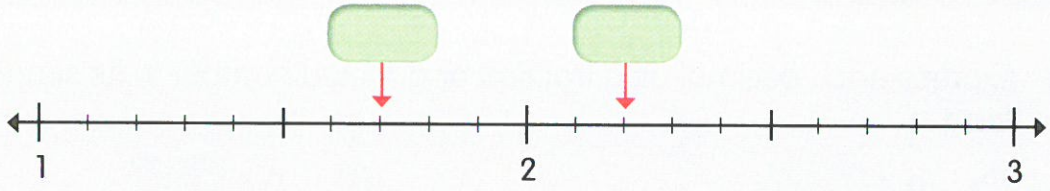
2 Express each amount in decimal form.

(a) 34 dollars 35 cents = $☐

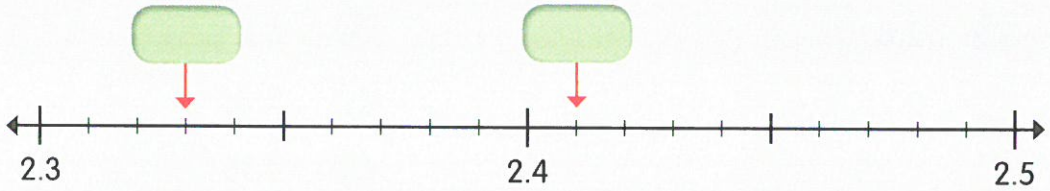
(b) 6 dollars 5 cents = $☐

3 Find the missing numbers.

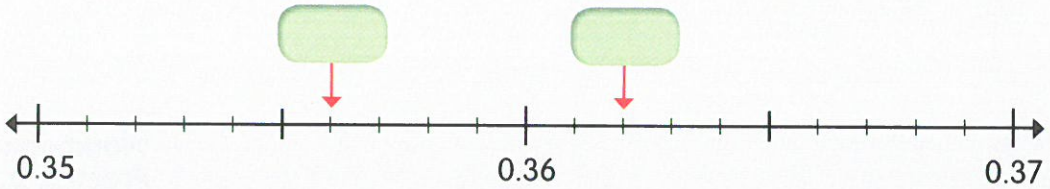
a



b



c



4 In 4.625,

a the digit ____ is in the hundredths place.

b the value of the digit 6 is ____.

c the digit 5 stands for ____.

d the value of the digit 4 is ____.

5 Find the missing numbers.

a $20 + 3 + 0.8 =$ ____

b $1 +$ ____ $+ 0.06 + 0.007 = 1.967$

c $3.401 = 3 + 0.4 +$ ____

d $0.354 =$ ____ $+ 0.05 + 0.004$

6 Which is greater, 2.793 or 2.85? ____

7 Arrange the decimals in increasing order.

6.216, 6.078, 6.109 ____

8 a What is 0.1 more than 36.41?

b What is 0.01 less than 5.69?

c What is 0.001 more than 8.065?

9 Find the missing numbers in the number patterns.

a 1.026, , 1.032, 1.035, 1.038, 1.041

b 3.7, 3.75, 3.8, 3.85, , 3.95

10 Round each decimal to the nearest whole number.

a 2.8 b 3.49

11 Round each decimal to 1 decimal place.

a 4.53 b 6.125

12 Round each decimal to 2 decimal places.

a 0.227 b 7.396

13 Express each of the following as a decimal.

a $2\frac{3}{4}$ = b $1\frac{4}{5}$ = c $9\frac{7}{50}$ =

14 Express each of the following as a fraction. Express each answer in its simplest form.

a 0.8 = b 1.9 = c 3.25 =

15 Use the digits 5, 3, 6 and 1 to form the smallest decimal with 2 decimal places.

Workbook B:
Chapter 10 Review,
pages 65–66
Maths Journal, page 67

Put on Your Thinking Cap!

1. I am smaller than 8 and have only 1 decimal place.
I am 8 when rounded to the nearest whole number.
The digit in my tenths place is odd.
The digit in my ones place is 2 less than the digit in the tenths place.
What number am I?

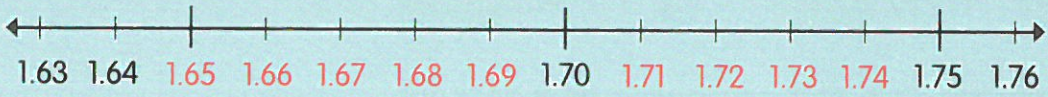
2. The height of a tree is 3 m when rounded to the nearest whole number.
Which of the following could be the actual height of the tree?

2.39 m	2.48 m	3.25 m	3.51 m

3. **Example**

A number has 2 decimal places. It is 1.7 when rounded to 1 decimal place. What could the numbers be?

Draw a number line to find the numbers.



The numbers in red are possible answers.

A number has 3 decimal places. It is 2.34 when rounded to 2 decimal places.

a. What could the numbers be? List the possible numbers.

b. Which of these numbers is the greatest?

c. Which of these numbers is the smallest?

Workbook B:
Put on Your Thinking Cap!
page 68

CHAPTER 11

The Four Operations of Decimals

Lessons

1. Addition
2. Subtraction
3. Multiplication
4. Division

Big Idea

Decimals can be added, subtracted, multiplied and divided like whole numbers.

Lesson 1

Addition

Adding decimals

Before you learn ...

The mass of an apple is 0.1 kg. The mass of an orange is 0.2 kg.
Use 

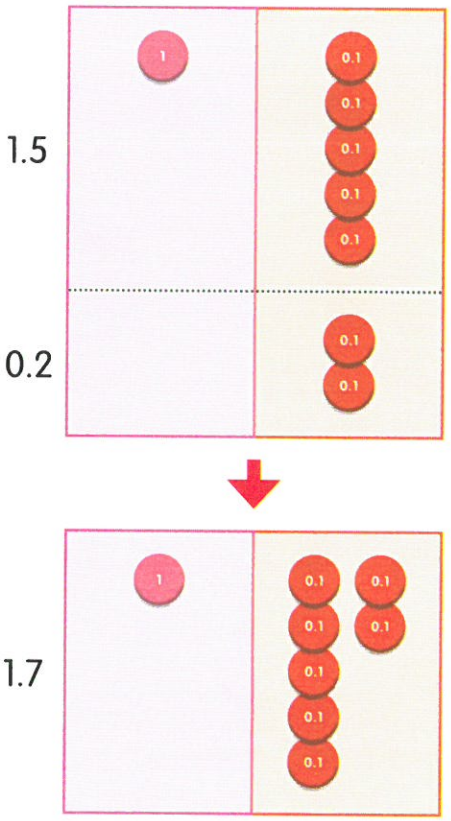
to show how to find the total mass of the apple and the orange.

Learn

Add decimals without renaming

1 Jessie drank 1.5 ℓ of orange juice. Her sister drank 0.2 ℓ of orange juice. How much orange juice did they drink altogether?

1.5 + 0.2 = ?



	1	.	5
+	0	.	2
	1	.	7

Step 1: Add the tenths.
Step 2: Add the ones.

1.5 + 0.2 = 1.7

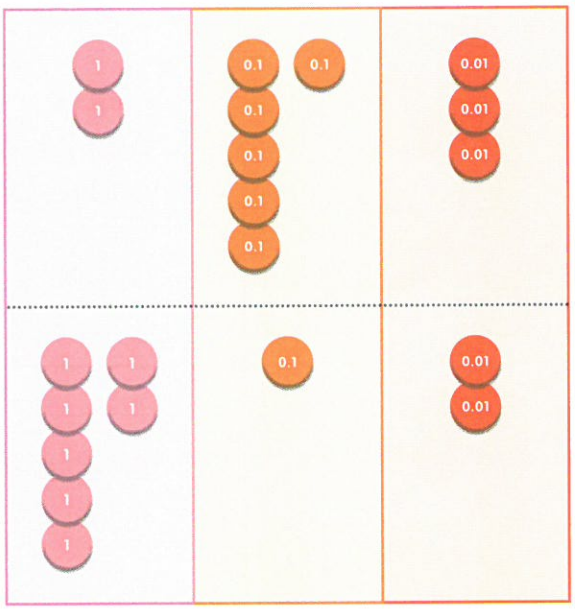
They drank 1.7 ℓ of orange juice altogether.

2 Find the sum of 2.63 and 7.12.

$2.63 + 7.12 = ?$

2.63

7.12



9.75

	2	.	6	3
+	7	.	1	2
	9	.	7	5

Step 1: Add the hundredths.
Step 2: Add the tenths.
Step 3: Add the ones.

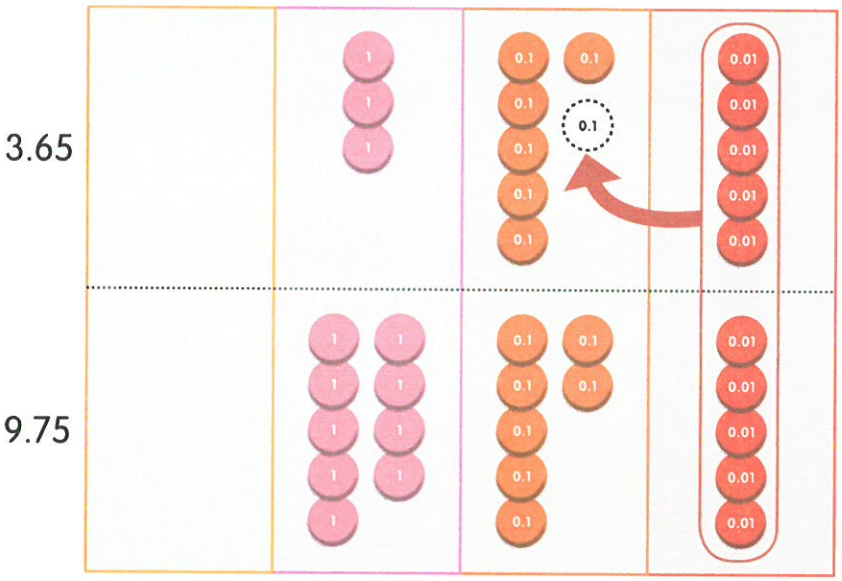
$2.63 + 7.12 = 9.75$

$2.63 \approx 3$
$7.12 \approx 7$
$3 + 7 = 10$
9.75 is close to 10.
So, the answer is reasonable.

Add decimals with renaming

3 Add 3.65 and 9.75.

3.65 + 9.75 = ?

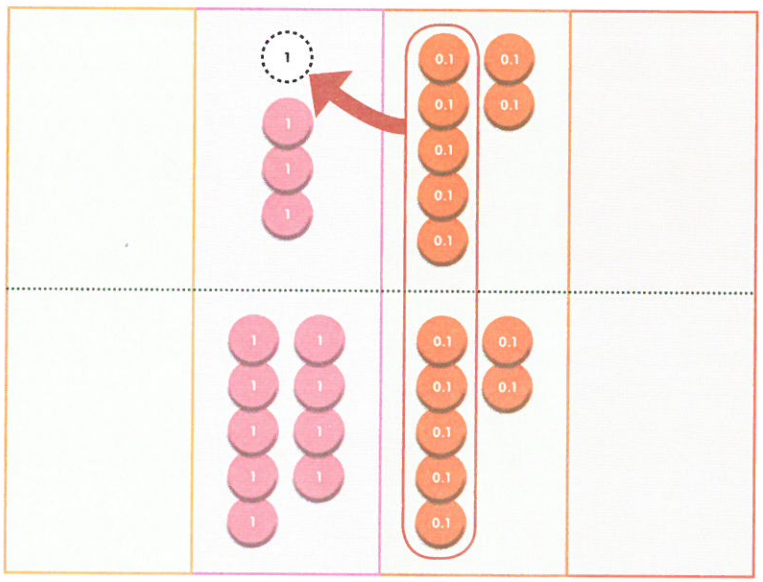


Step 1

Add the hundredths and rename.

				1
	3	.	6	5
+	9	.	7	5
		.		0

10 hundredths
= 1 tenth 0 hundredths

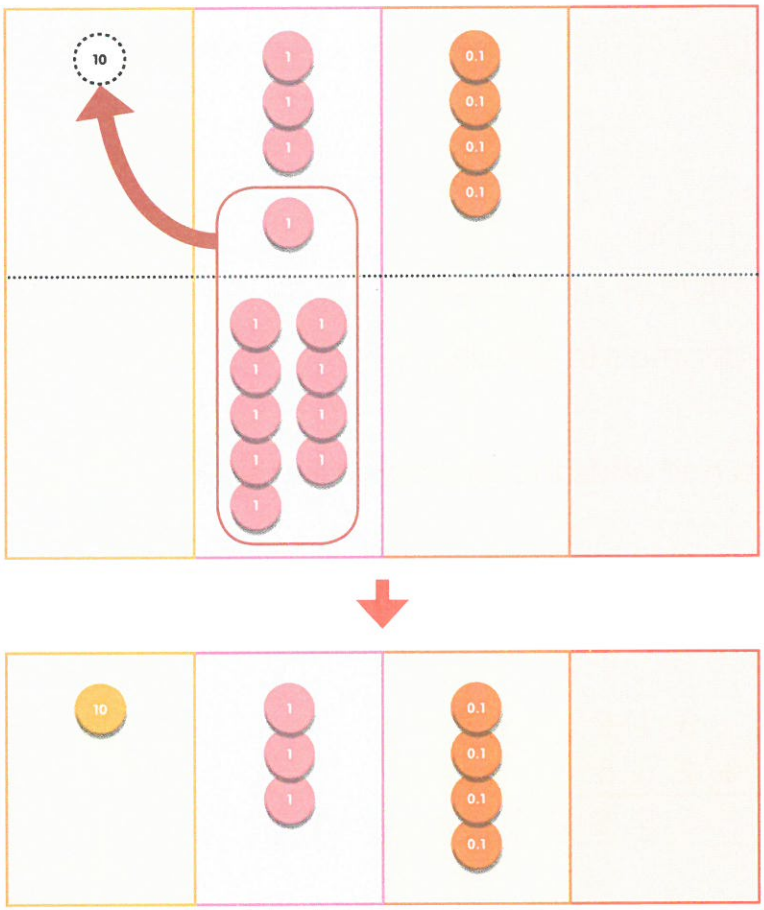


Step 2

Add the tenths and rename.

	1		1	
	3	.	6	5
+	9	.	7	5
		.	4	0

14 tenths
= 1 one 4 tenths



13.4

Step 3

Add the ones and rename.

		1		1	
		3	.	6	5
+		9	.	7	5
	1	3	.	4	0

13 ones = 1 ten 3 ones

3.65 + 9.75 = 13.4

3.65 ≈ 4
9.75 ≈ 10
4 + 10 = 14
13.4 is close to 14.
So, the answer is reasonable.

Hands-on Activity

Add decimals.

Work in pairs.

Use  and  .

1 a Estimate the value of 3.1 + 2.85.

b Add the two decimals in a using  .

2 Your partner shows and adds the decimals using  .

3 Compare the answer with the sum of 310 and 285. What do you notice?

Example

	3	.	1	0
+	2	.	8	5
	5	.	9	5

→

	3	1	0
+	2	8	5
	5	9	5

4 Switch roles. Repeat 1 and 2 with these decimals.

a 0.16 + 0.2

b 1.81 + 0.17

c 0.9 + 0.6

d 12.97 + 79.43

App-tivity @ www.mceducation.com/sgstudent/mapp4

Guided Practice

1 Estimate. Then, add.

a
$$\begin{array}{r} 0.5 \\ +\ 2.4 \\ \hline \end{array}$$

b
$$\begin{array}{r} 0.22 \\ +\ 0.36 \\ \hline \end{array}$$

c
$$\begin{array}{r} 0.3 \\ +\ 1.07 \\ \hline \end{array}$$

d
$$\begin{array}{r} 71.9 \\ +\ 39.2 \\ \hline \end{array}$$

e
$$\begin{array}{r} 8.08 \\ +\ 4.99 \\ \hline \end{array}$$

f
$$\begin{array}{r} 11.65 \\ +\ 4.35 \\ \hline \end{array}$$

2 Add 0.38 and 0.96.

3 Estimate. Then, find the sums of these decimals.

a 2.4 and 3.4

b 0.8 and 0.5

c 3.84 and 11.15

d 1.4 and 3.95

e 1.98 and 1.06

f 7 and 6.35

g 36.08 and 3.99

h 4.21 and 9.79

Maths Sharing

Add decimals mentally.

Elliot solved the following mentally.

1 Add 2.1 and 4.3.

2.1 + 4.3 = ?
2 + 4 = 6
0.1 + 0.3 = 0.4
So, 6 + 0.4 = 6.4.

2 Find the sum of 0.25 and 0.09.

0.25 + 0.09 = 0.24 + 0.1
= 0.34

0.24 0.01

What other ways are there?
Discuss with your classmates.

Workbook B: Practice 1, pages 69–72

Lesson 2

Subtraction

Subtracting decimals

Before you learn ...

A ribbon 2.7 m in length is cut into two pieces. One piece is 0.4 m long.
Use 

to show how to find the length of the second piece.

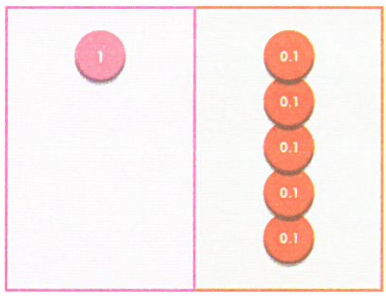
Learn

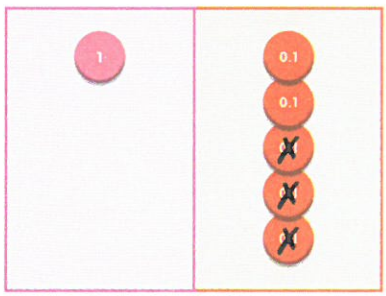
Subtract decimals without renaming

1 The mass of a pumpkin is 1.5 kg.
A rock melon weighs 0.3 kg less than the pumpkin.
What is the mass of the rock melon?

$1.5 - 0.3 = ?$

1.5



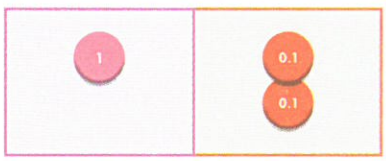


Step 1

Subtract the tenths.

	1	.	5
−	0	.	3
		.	2

1.2



Step 2

Subtract the ones.

	1	.	5
−	0	.	3
	1	.	2

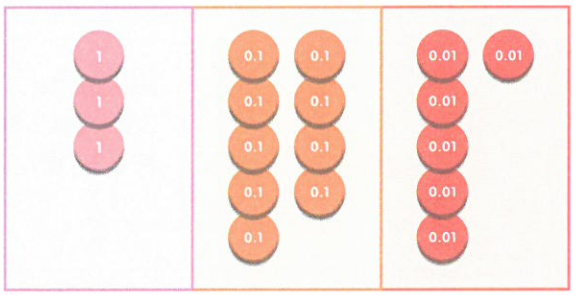
$1.5 - 0.3 = 1.2$

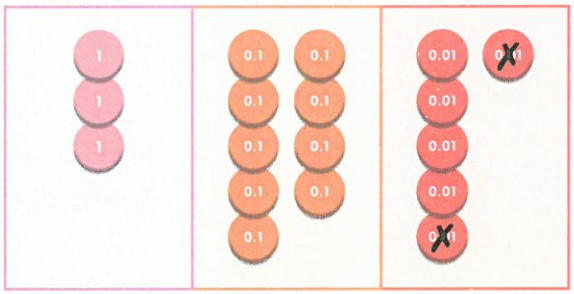
The mass of the rock melon is 1.2 kg.

2 Subtract 1.42 from 3.96.

$3.96 - 1.42 = ?$

3.96

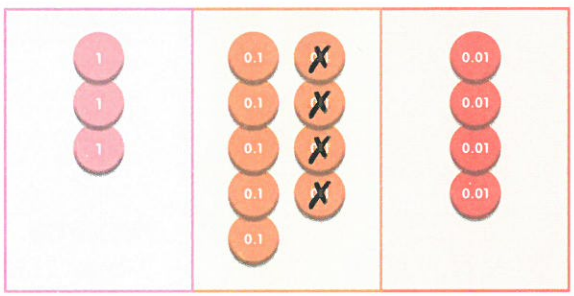




Step 1

Subtract the hundredths.

	3	.	9	6
−	1	.	4	2
		.		4

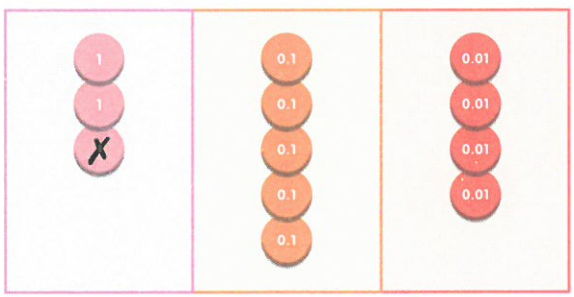


Step 2

Subtract the tenths.

	3	.	9	6
−	1	.	4	2
		.	5	4

2.54



Step 3

Subtract the ones.

	3	.	9	6
−	1	.	4	2
	2	.	5	4

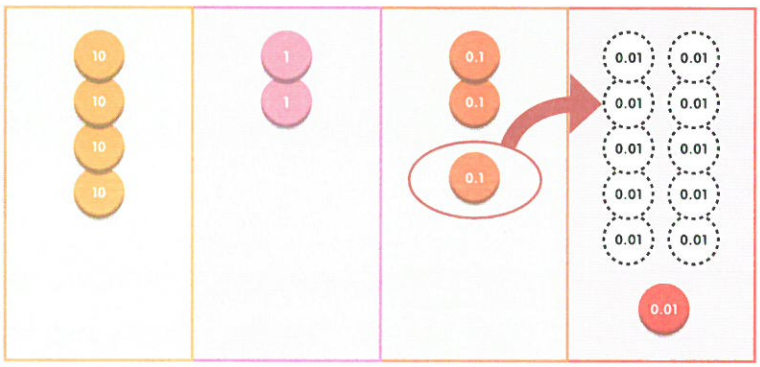
$3.96 - 1.42 = 2.54$

Subtract decimals with renaming

3 Find the difference between 29.98 and 42.31.

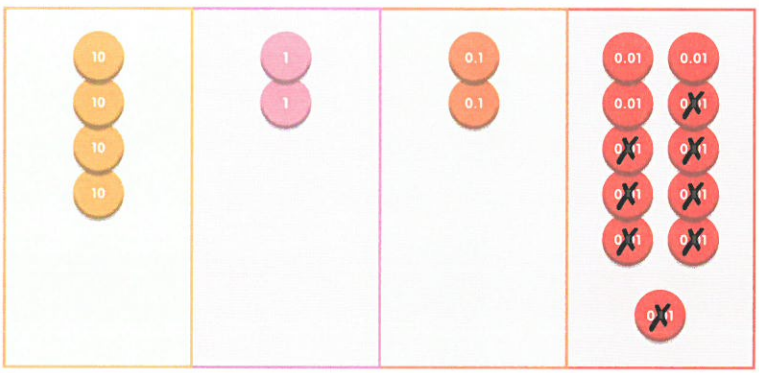
$42.31 - 29.98 = ?$

42.31



Rename.
3 tenths 1 hundredth
= 2 tenths 11 hundredths

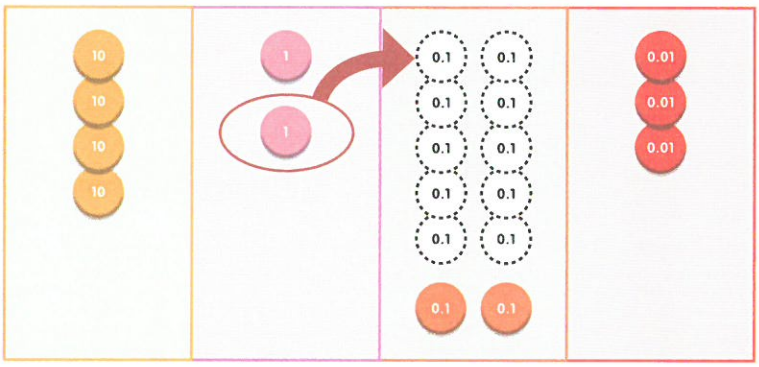
				2	11
	4	2	.	3	1
−	2	9	.	9	8
			.		



Step 1

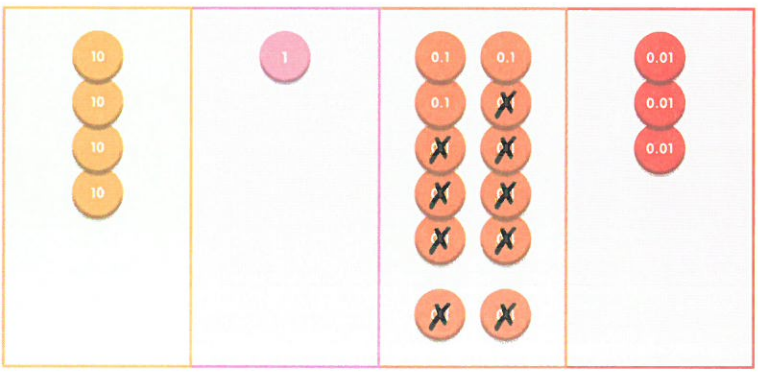
Subtract the hundredths.

				2	11
	4	2	.	3	1
−	2	9	.	9	8
			.		3



Rename.
2 ones 2 tenths
= 1 one 12 tenths

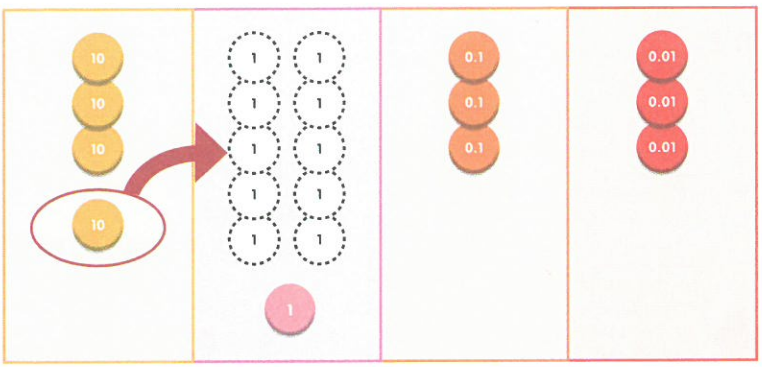
		1		12	11	
	4	2	.	3	1	
−	2	9	.	9	8	
			.		3	



Step 2

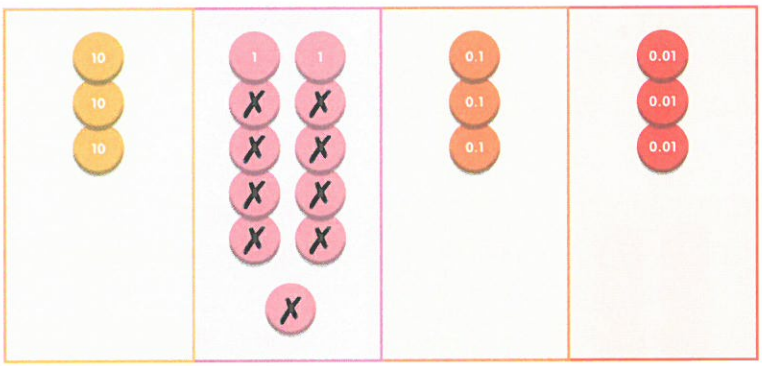
Subtract the tenths.

		1		12	11	
	4	2	.	3	1	
−	2	9	.	9	8	
			.	3	3	



Rename.
4 tens 1 one
= 3 tens 11 ones

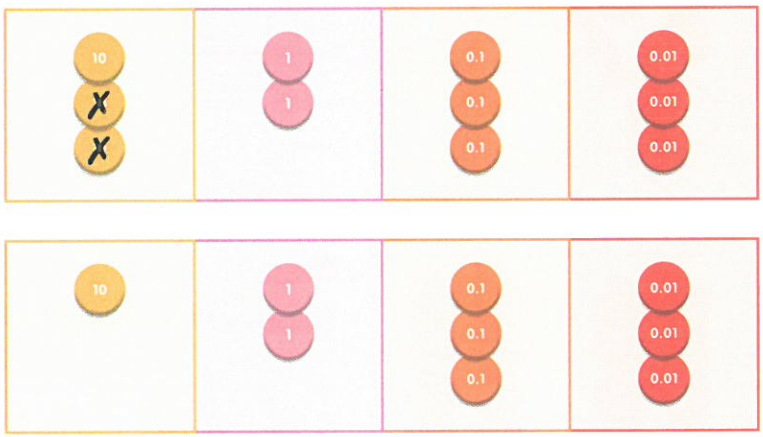
	3	11	12	11
	~~4~~	~~2~~	. ~~3~~	~~1~~
−	2	9	. 9	8
			. 3	3



Step 3

Subtract the ones.

	3	11	12	11
	~~4~~	~~2~~	. ~~3~~	~~1~~
−	2	9	. 9	8
		2	. 3	3



Step 4

Subtract the tens.

	3	11	12	11
	~~4~~	~~2~~	. ~~3~~	~~1~~
−	2	9	. 9	8
	1	2	. 3	3

12.33

$42.31 - 29.98 = 12.33$

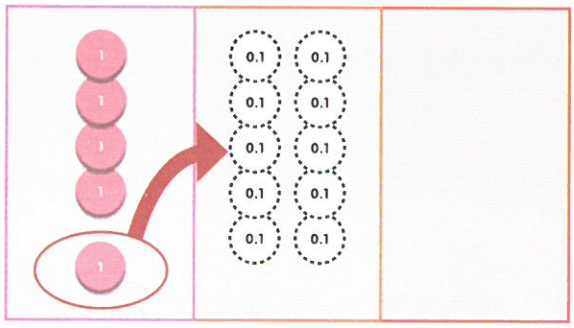
The difference between 29.98 and 42.31 is 12.33.

42.31 ≈ 40
29.98 ≈ 30
40 − 30 = 10
42.31 − 29.98 ≈ 10
12.33 is close to 10.
So, the answer is reasonable.

4 Subtract 1.35 from 5.

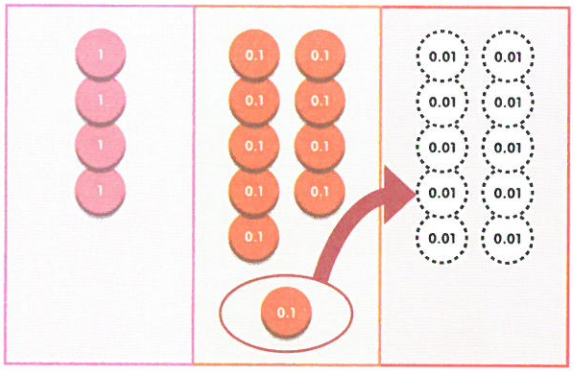
$5.00 - 1.35 = ?$

5.00



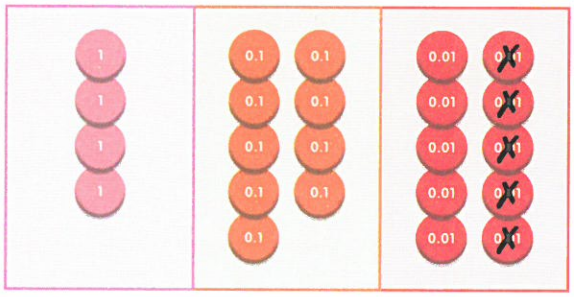
Rename.
5 ones = 4 ones 10 tenths

	4		10	
	5	.	0	0
−	1	.	3	5
		.		



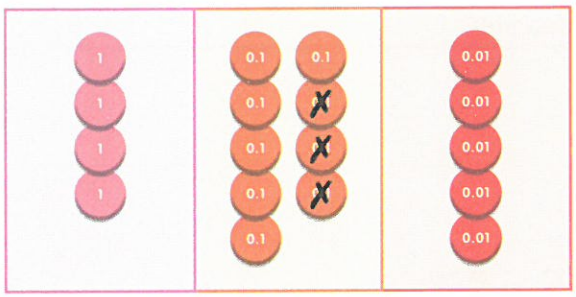
Rename.
10 tenths = 9 tenths 10 hundredths

	4		9 10	10
	5	.	0	0
−	1	.	3	5
		.		



Step 1
Subtract the hundredths.

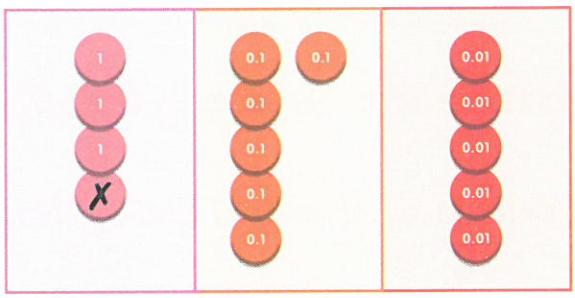
	4		9 10	10
	5	.	0	0
−	1	.	3	5
		.		5



Step 2

Subtract the tenths.

	4	9 10	10
	5	. 0	0
−	1	. 3	5
		. 6	5

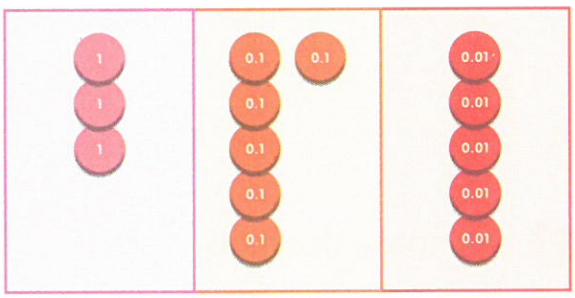


Step 3

Subtract the ones.

	4	9 10	10
	5	. 0	0
−	1	. 3	5
	3	. 6	5

3.65



$5 - 1.35 = 3.65$

1.35 ≈ 1
5 − 1 = 4
5 − 1.35 ≈ 4
3.65 is close to 4.
So, the answer is reasonable.

Hands-on Activity

Subtract decimals.

Work in pairs.

Use 10 1 0.1 0.01 0.001 and  .

1 a Estimate the value of 0.97 − 0.25.

b Subtract 0.25 from 0.97 in a using  .

2 Your partner shows and subtracts the decimals using 10 1 0.1 0.01 0.001.

3 Compare the answer with the difference between 97 and 25. What do you notice?

Example

	0	.	9	7
−	0	.	2	5
	0	.	7	2

→

	9	7
−	2	5
	7	2

4 Switch roles. Repeat 1 and 2 with these decimals.

a 0.9 − 0.4

b 1.48 − 1.23

c 3.2 − 0.54

d 50 − 37.42

App-tivity @ www.mceducation.com/sgstudent/mapp4

Guided Practice

1 Estimate. Then, subtract.

a
$$\begin{array}{r} 3.48 \\ -\ 3.37 \\ \hline \end{array}$$

b
$$\begin{array}{r} 18.32 \\ -\ 4.36 \\ \hline \end{array}$$

c
$$\begin{array}{r} 4.00 \\ -\ 2.87 \\ \hline \end{array}$$

2 Subtract 3.58 from 6.12.

3 Find the values of each of the following. Check if your answers are reasonable.

a $3.6 - 2.1$

b $0.8 - 0.09$

c $8 - 2.5$

d $7.1 - 2.06$

e $27.43 - 5.65$

f $16.78 - 5.9$

Maths Sharing

Subtract decimals mentally.

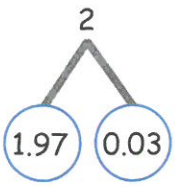
Aidan solved the following mentally.

1 Find the value of $2.8 - 1.5$.

$2.8 - 1.5 = ?$
$2 - 1 = 1$
$0.8 - 0.5 = 0.3$
$1 + 0.3 = 1.3$
So, $2.8 - 1.5 = 1.3$

2 Subtract 1.97 from 6.

$6 - 1.97 = ?$
$1.97 \approx 2$



Step 1 $6 - 2 = 4$

Step 2 $4 + 0.03 = 4.03$

So, $6 - 1.97 = 4.03$.

What other ways are there?
Discuss with your classmates.

Workbook B: Practice 2, pages 73–76

Lesson 3

Multiplication

Multiplying decimals by a whole number

Before you learn ...

An apple costs $0.30. Aisha buys 4 apples.
Explain how to find the cost of 4 such apples.

Learn

Multiply without renaming

1 **a** What is 4 × 2?

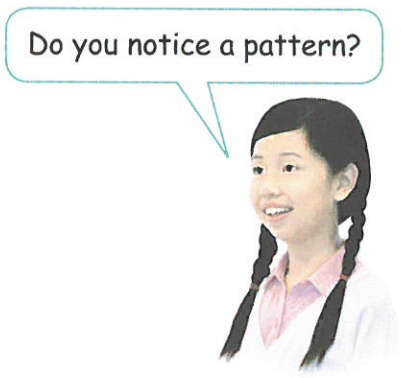
4 × 2 = 4 ones × 2
= 8 ones
= 8

b What is 0.4 × 2?

0.4 × 2 = 4 tenths × 2
= 8 tenths
= 0.8

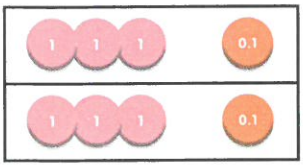
c What is 0.04 × 2?

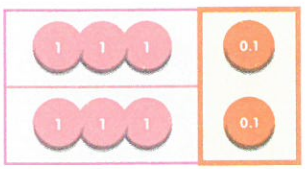
0.04 × 2 = 4 hundredths × 2
= 8 hundredths
= 0.08



2 Find the product of 3.1 and 2.

$3.1 \times 2 = ?$



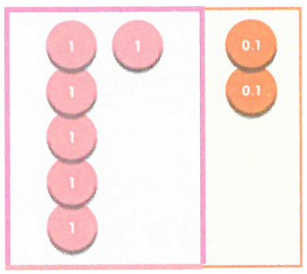


Step 1

Multiply the tenths by 2.

1 tenth × 2 = 2 tenths

	3	.	1
×			2
		.	**2**



Step 2

Multiply the ones by 2.

3 ones × 2 = 6 ones

	3	.	1
×			2
	6	.	2

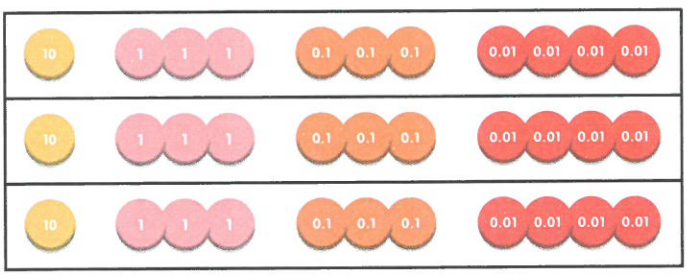
$3.1 \times 2 = 6.2$

The product of 3.1 and 2 is 6.2.

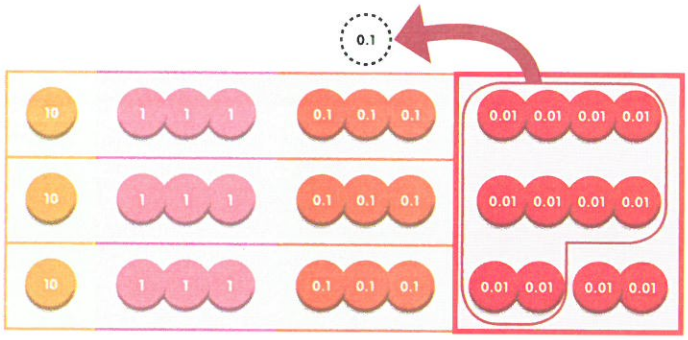
Multiply with renaming

3 Multiply 13.34 by 3.

$13.34 \times 3 = ?$



Continued on next page

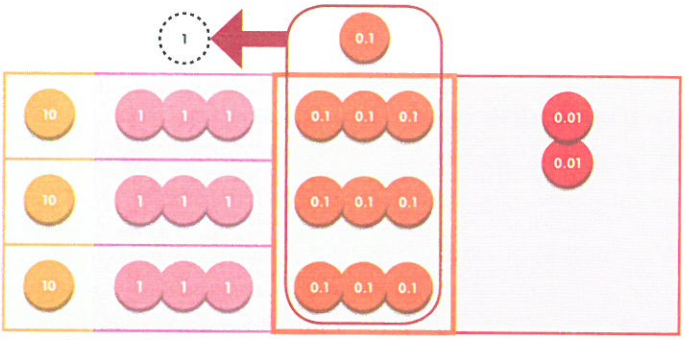


Step 1

Multiply the hundredths by 3.
4 hundredths × 3 = 12 hundredths

Rename.
12 hundredths
= 1 tenth 2 hundredths

				1	
	1	3	.	3	4
×					3
			.		**2**



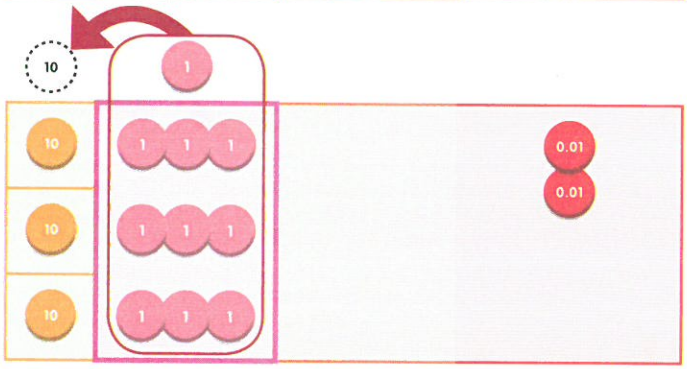
Step 2

Multiply the tenths by 3.
3 tenths × 3 = 9 tenths

Add the tenths.
9 tenths + 1 tenth
= 10 tenths

Rename.
10 tenths = 1 one 0 tenths

		1		1	
	1	3	.	3	4
×					3
			.	**0**	2



Step 3

Multiply the ones by 3.
3 ones × 3 = 9 ones

Add the ones.
9 ones + 1 one = 10 ones

Rename.
10 ones = 1 ten 0 ones

	1	1		1	
	1	3	.	3	4
×					3
		0	.	0	2

Step 4

Multiply the tens by 3.
1 ten × 3 = 3 tens

Add the tens.
3 tens + 1 ten = 4 tens

	1	1		1	
	1	3	.	3	4
×					3
	4	0	.	0	2

$13.34 \times 3 = 40.02$

13.34 ≈ 10
10 × 3 = 30
13.34 × 3 ≈ 30
40.02 is close to 30.
So, the answer is reasonable.

Hands-on Activity

Multiply decimals.

Work in pairs.

Use 10, 1, 0.1, 0.01, 0.001.

1. Estimate the product of 2.3 and 2.
2. Your partner uses 10, 1, 0.1, 0.01, 0.001 to find the product of 2.3 and 2.
3. Compare the answer with the product of 23 and 2. What do you notice?

Example

$$\begin{array}{r} 2.3 \\ \times\ \ 2 \\ \hline 4.6 \end{array} \rightarrow \begin{array}{r} 23 \\ \times\ \ 2 \\ \hline 46 \end{array}$$

4. Repeat 1 and 2 with the following.
   a. 0.11×9
   b. 12.13×3
   c. 2.2×5
   d. 3.57×3

App-tivity @ www.mceducation.com/sgstudent/mapp4

Guided Practice

1. Multiply.
   a. $0.3 \times 2 =$ ____
   b. $0.03 \times 2 =$ ____
2. Estimate. Then, multiply.
   a. $\begin{array}{r} 2.3 \\ \times\ \ 7 \\ \hline \end{array}$ ____
   b. $\begin{array}{r} 1.07 \\ \times\ \ 9 \\ \hline \end{array}$ ____
   c. $\begin{array}{r} 11.46 \\ \times\ \ 8 \\ \hline \end{array}$ ____
3. Find the products of the following. Check if your answers are reasonable.
   a. 6.7 and 6 ____
   b. 23.21 and 9 ____

Workbook B: Practice 3, pages 77–80

Lesson 4

Division

Dividing decimals by a whole number

Before you learn ...

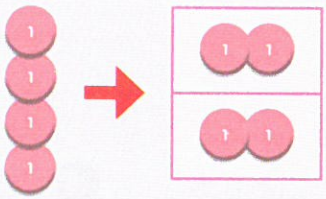
A pipe was 3.6 m long. A plumber cut the pipe into 2 equal pieces.
Use 

to show how to find the length of each piece of pipe.

Learn

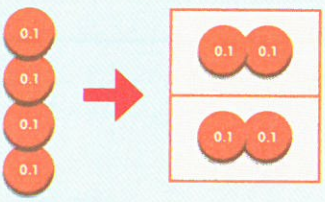
Divide without renaming

1 **a** What is 4 ÷ 2?



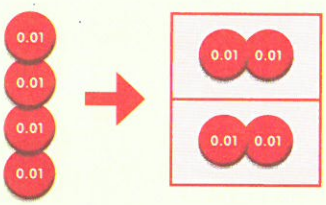
$4 \div 2$
$= 4 \text{ ones} \div 2$
$= 2 \text{ ones}$
$= 2$

b What is 0.4 ÷ 2?

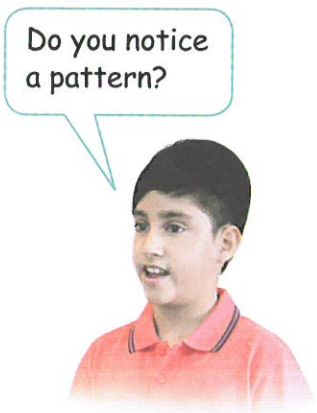


$0.4 \div 2$
$= 4 \text{ tenths} \div 2$
$= 2 \text{ tenths}$
$= 0.2$

c What is 0.04 ÷ 2?

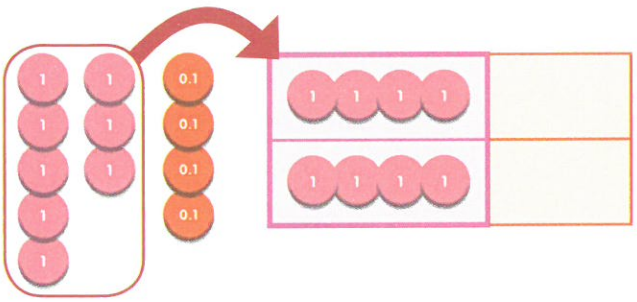


$0.04 \div 2$
$= 4 \text{ hundredths} \div 2$
$= 2 \text{ hundredths}$
$= 0.02$



2 Divide 8.4 by 2.

$8.4 \div 2 = ?$

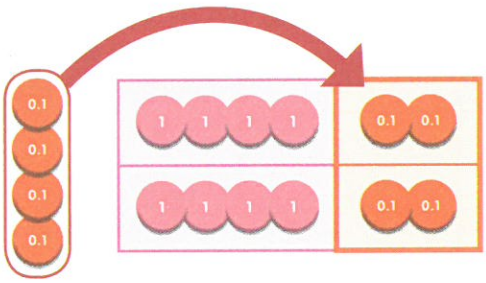


Step 1

Divide the ones by 2.

8 ones ÷ 2
= 4 ones in each group

	4	.	
2)	8	.	4
	8		



Step 2

Divide the tenths by 2.

4 tenths ÷ 2
= 2 tenths in each group

	4	.	**2**
2)	8	.	4
	8		
			4
			4
			0

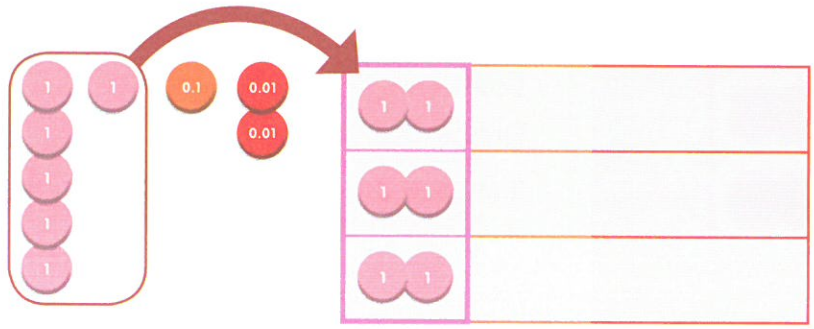
$8.4 \div 2 = 4.2$

Let's recap!

Step 1	Step 2
4 . 2) 8 . 4 **8** —	4 . **2** 2) 8 . 4 8 — **4** **4** — **0**

Divide with renaming

3 Divide 6.12 by 3.

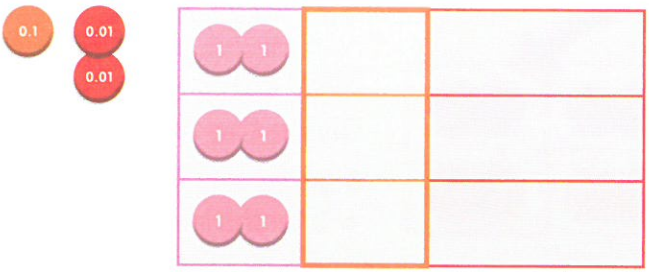


Step 1

Divide the ones by 3.

6 ones ÷ 3
= 2 ones in each group

$$\begin{array}{r} 2. \\ 3\overline{)\,6.12} \\ \underline{6} \\ \end{array}$$

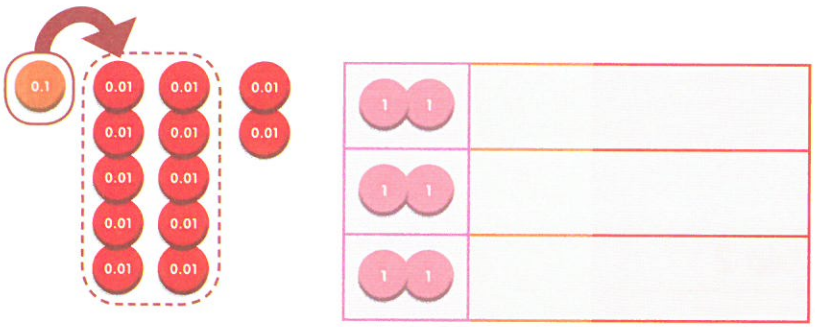


Step 2

Divide the tenths by 3.

1 tenth ÷ 3
= 0 tenths in each group with remainder 1

$$\begin{array}{r} 2.0 \\ 3\overline{)\,6.12} \\ \underline{6} \\ 1\end{array}$$



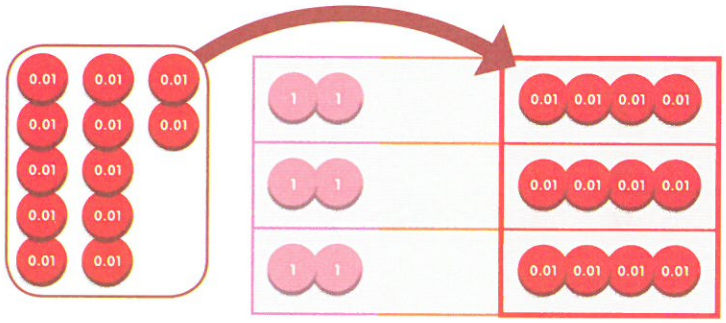
Rename.

1 tenth
= 10 hundredths

Add the hundredths.

10 hundredths
+ 2 hundredths
= 12 hundredths

$$\begin{array}{r} 2.0 \\ 3\overline{)\,6.12} \\ \underline{6} \\ 12\end{array}$$



Step 3

Divide the hundredths by 3.

12 hundredths ÷ 3
= 4 hundredths in each group

$$\begin{array}{r} 2.04 \\ 3\overline{)\,6.12} \\ \underline{6} \\ 12 \\ \underline{12} \\ 0\end{array}$$

$6.12 \div 3 = 2.04$

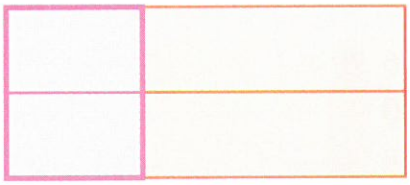
6.12 ≈ 6
6 ÷ 3 = 2
6.12 ÷ 3 ≈ 2
2.04 is close to 2.
So, the answer is reasonable.

Let's recap!

Step 1	Step 2	Step 3
$\begin{array}{r} 2. \\ 3\overline{)6.12} \\ 6 \\ \hline \end{array}$	$\begin{array}{r} 2.0 \\ 3\overline{)6.12} \\ 6 \\ \hline 1 \end{array}$	$\begin{array}{r} 2.04 \\ 3\overline{)6.12} \\ 6 \\ \hline 12 \\ 12 \\ \hline 0 \end{array}$

4 Divide 1 by 2.

$1 \div 2 = ?$

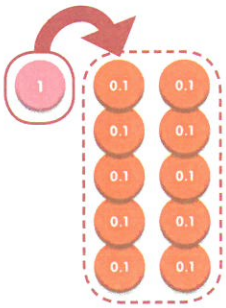


Step 1

Divide the ones by 2.

1 one ÷ 2 = 0 ones in each group with remainder 1 one

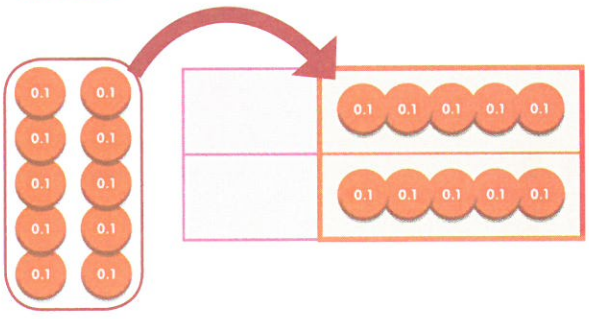
$\begin{array}{r} 0. \\ 2\overline{)1.0} \\ \\ \end{array}$



Rename.

1 one = 10 tenths

$\begin{array}{r} 0. \\ 2\overline{)1.0} \\ \\ \end{array}$



Step 2

Divide the tenths by 2.

10 tenths ÷ 2
= 5 tenths in each group

$\begin{array}{r} 0.5 \\ 2\overline{)1.0} \\ 1 0 \\ \hline 0 \end{array}$

$1 \div 2 = 0.5$

Continued on next page

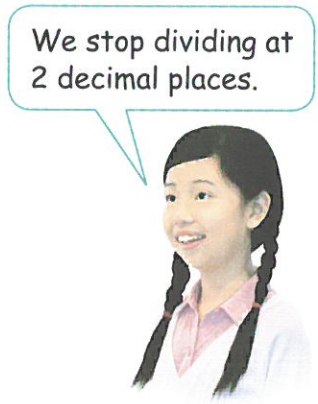
Let's recap!

Step 1	Step 2
$\begin{array}{r} 0. \\ 2\overline{)1.0} \\ \\ \end{array}$	$\begin{array}{r} 0.5 \\ 2\overline{)1.0} \\ \underline{1} \\ 0 \end{array}$

5 Divide 2 by 3. Correct your answer to 1 decimal place.

$2 \div 3 = ?$

Step 1	Step 2
$\begin{array}{r} 0.6 \\ 3\overline{)2.00} \\ \underline{18} \\ 2 \end{array}$	$\begin{array}{r} 0.66 \\ 3\overline{)2.00} \\ \underline{18} \\ 20 \\ \underline{18} \\ 2 \end{array}$

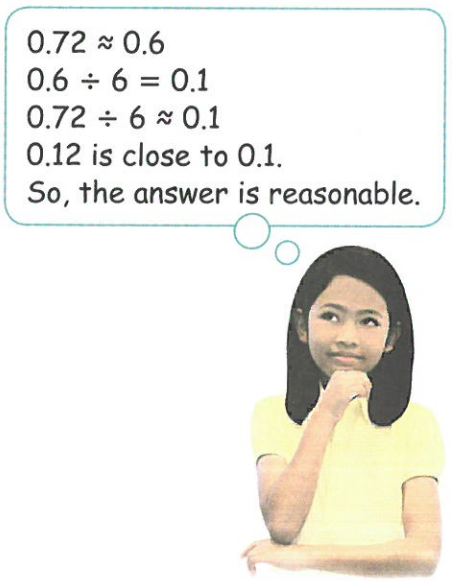


$2 \div 3 = 0.7$ (correct to 1 decimal place)

6 Divide 0.72 by 6. Correct your answer to 1 decimal place.

$0.72 \div 6 = ?$

Step 1	Step 2
$\begin{array}{r} 0.1 \\ 6\overline{)0.72} \\ \underline{6} \\ 1 \end{array}$	$\begin{array}{r} 0.12 \\ 6\overline{)0.72} \\ \underline{6} \\ 12 \\ \underline{12} \\ 0 \end{array}$



$0.72 \div 6 = 0.1$ (correct to 1 decimal place)

7 Divide 5.03 by 4. Correct your answer to 1 decimal place.

$5.03 \div 4 = ?$

Step 1	Step 2	Step 3
$4\overline{)5.03}$ 4 1	$4\overline{)5.03}$ 4 $1\,0$ 8 2	$4\overline{)5.03}$ 4 $1\,0$ 8 $2\,3$ $2\,0$ 3

5.03 ≈ 4
4 ÷ 4 = 1
5.03 ÷ 4 ≈ 1
1.25 is close to 1.
So, the answer is reasonable.

$5.03 \div 4 = 1.3$ (correct to 1 decimal place)

8 Divide 9 by 7. Correct your answer to 2 decimal places.

$9 \div 7 = ?$

We stop dividing at 3 decimal places.

Step 1	Step 2	Step 3	Step 4
$7\overline{)9.00}$ 7 2	$7\overline{)9.00}$ 7 $2\,0$ $1\,4$ 6	$7\overline{)9.00}$ 7 $2\,0$ $1\,4$ $6\,0$ $5\,6$ 4	$7\overline{)9.000}$ 7 $2\,0$ $1\,4$ $6\,0$ $5\,6$ $4\,0$ $3\,5$ 5

$9 \div 7 = 1.29$ (correct to 2 decimal places)

Hands-on Activity

Divide decimals.

Work in pairs.

Use 10, 1, 0.1, 0.01, 0.001.

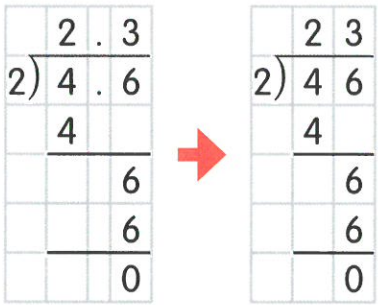
1. Estimate the value of 4.6 ÷ 2.

2. Your partner uses 10, 1, 0.1, 0.01, 0.001 to show 4.6 ÷ 2.

3. Show the division and write its value as a decimal.

4. Compare the value in 2 with the value of 46 ÷ 2. What do you notice?

Example



	2	.	3
2)	4	.	6
	4		
			6
			6
			0

	2	3
2)	4	6
	4	
		6
		6
		0

5. Repeat 1 and 2 with the following.
   - a. 0.84 ÷ 2
   - b. 0.93 ÷ 3
   - c. 3.2 ÷ 2
   - d. 6.25 ÷ 5
   - e. 2 ÷ 5
   - f. 5 ÷ 2

App-tivity @
www.mceducation.com/sgstudent/mapp4

Guided Practice

1. Divide.

   a. $0.6 \div 3 =$ ☐

   b. $0.06 \div 3 =$ ☐

2. Estimate. Then, divide.

   a. ☐ $2\overline{)6.04}$

   b. ☐ $5\overline{)0.8}$

   c. ☐ $2\overline{)0.92}$

   d. ☐ $3\overline{)2.25}$

3. Estimate. Then, divide.

   a. $4.8 \div 4 =$ ☐

   b. $8.46 \div 2 =$ ☐

   c. $3.5 \div 7 =$ ☐

   d. $9.03 \div 3 =$ ☐

   e. $12.92 \div 4 =$ ☐

   f. $28.02 \div 6 =$ ☐

4. Divide and correct your answer to 1 decimal place.

   a. $8.7 \div 4$ ☐

   b. $7 \div 6$ ☐

Workbook B: Practice 4, pages 81–86

Chapter 11 Review

1. Add.

   a. $\begin{array}{r} 3.4 \\ +\ 6.5 \\ \hline \square \end{array}$

   b. $\begin{array}{r} 3.62 \\ +\ 5.04 \\ \hline \square \end{array}$

   c. $\begin{array}{r} 9.81 \\ +\ 8.79 \\ \hline \square \end{array}$

2. Find the sum of these decimals.

   a. 34.8 and 2.66 ☐

   b. 3.7 and 8.9 ☐

   c. 9.36 and 1.98 ☐

   d. 8.57 and 10.49 ☐

3 Add.

(a) $1.7 + 0.6 =$ ☐

(b) $0.45 + 2.7 =$ ☐

(c) $0.25 + 0.68 =$ ☐

(d) $4.08 + 2.36 =$ ☐

4 Subtract.

(a)
$$\begin{array}{r} 5.3 \\ -\ 2.1 \\ \hline \square \end{array}$$

(b)
$$\begin{array}{r} 30.38 \\ -\ 12.62 \\ \hline \square \end{array}$$

(c)
$$\begin{array}{r} 17.43 \\ -\ 4.57 \\ \hline \square \end{array}$$

5 Find the difference between these decimals.

(a) 0.6 and 0.28 ☐

(b) 9.02 and 8.77 ☐

(c) 7.62 and 3.99 ☐

(d) 20 and 4.78 ☐

6 Subtract.

(a) $4.5 - 2.6 =$ ☐

(b) $8 - 2.98 =$ ☐

(c) $0.7 - 0.32 =$ ☐

(d) $32.4 - 10.84 =$ ☐

7 Multiply.

(a)
$$\begin{array}{r} 2.9 \\ \times\ \ 6 \\ \hline \square \end{array}$$

(b)
$$\begin{array}{r} 3.21 \\ \times\ \ 3 \\ \hline \square \end{array}$$

(c)
$$\begin{array}{r} 6.07 \\ \times\ \ 4 \\ \hline \square \end{array}$$

8 Multiply.

(a) $2.85 \times 2 =$ ☐

(b) $8 \times 5.96 =$ ☐

(c) $42.04 \times 2 =$ ☐

(d) $9 \times 0.34 =$ ☐

9 Divide.

(a) ☐
$$2\overline{)\,8.2}$$

(b) ☐
$$4\overline{)\,5.8}$$

(c) ☐
$$3\overline{)\,4.11}$$

10 Divide.

a $6.36 \div 3 =$ ☐

b $5.92 \div 8 =$ ☐

c $13.7 \div 2 =$ ☐

d $5 \div 4 =$ ☐

11 Divide 9.7 by 6. Correct your answer to the nearest whole number. ☐

12 Divide 13 by 4. Correct your answer to 1 decimal place. ☐

Workbook B:
Chapter 11 Review, pages 87–92
Maths Journal, page 93

Put on Your Thinking Cap!

1 Find the missing digit.

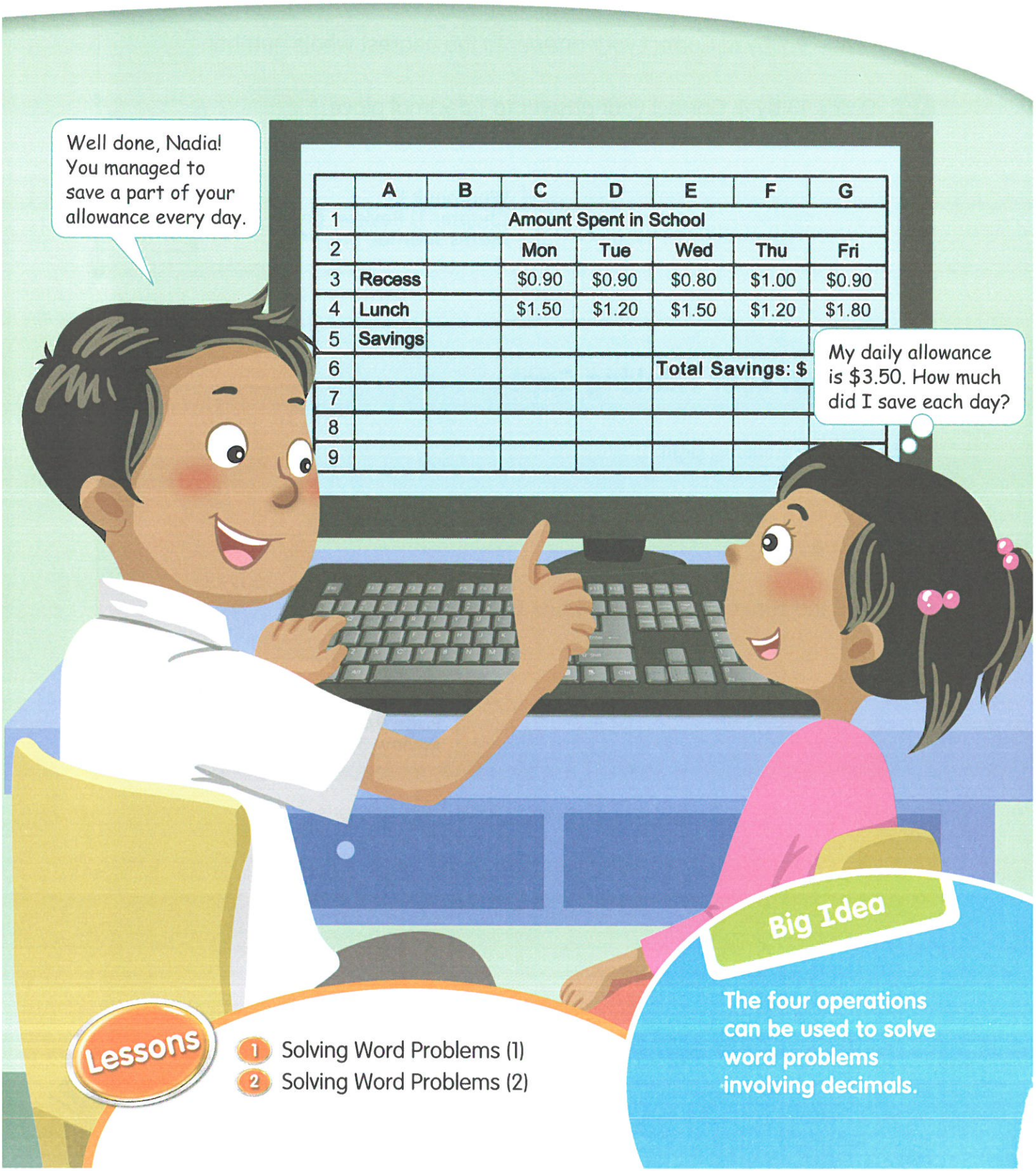
$$\begin{array}{r} 4\square.82 \\ -\ 16.35 \\ \hline 26.47 \end{array}$$

2 Find the sum of $1.5 + 2.7 + 4.6 + 0.4 + 2.3 + 3.5$.

Workbook B:
Put on Your Thinking Cap!
Page 94
Review 5, pages 95–98

CHAPTER 12

Decimals: Word Problems



	A	B	C	D	E	F	G
1	Amount Spent in School						
2			Mon	Tue	Wed	Thu	Fri
3	Recess		$0.90	$0.90	$0.80	$1.00	$0.90
4	Lunch		$1.50	$1.20	$1.50	$1.20	$1.80
5	Savings						
6					Total Savings: $		
7							
8							
9							

Lessons

Big Idea

The four operations can be used to solve word problems involving decimals.

Lesson 1

Solving Word Problems (1)

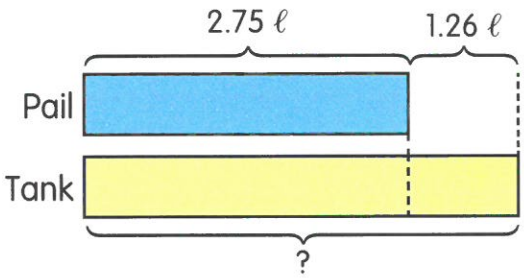
Solving word problems involving decimals

Before you Learn ...

Gary ordered a meal that cost $8.95 and a dessert that cost $5.90. Explain how to find the amount Gary paid in total.

Learn

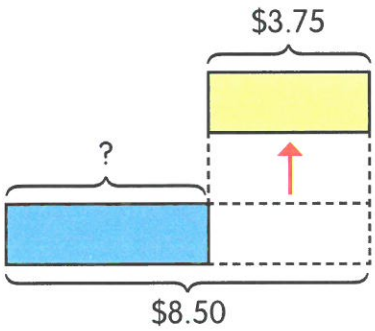
1 A pail contained 2.75 ℓ of water. A tank contained 1.26 ℓ more water than the pail. How much water was there in the tank?



2.75 + 1.26 = 4.01

There was 4.01 ℓ of water in the tank.

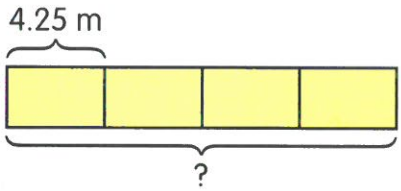
2 Siti had $8.50. She spent $3.75 on a book. How much money did she have left?



$8.50 − $3.75 = $4.75

She had $4.75 left.

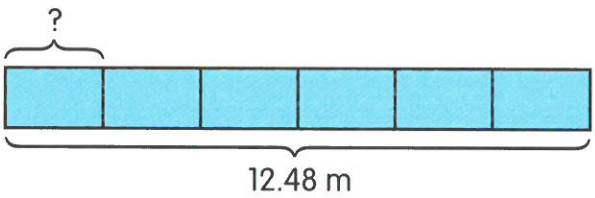
3 Julie used 4.25 m of cloth to make a dress.
How much cloth did she use to make 4 such dresses?



$4.25 \times 4 = 17$

She used 17 m of cloth to make 4 such dresses.

4 The length of a garden hose was 12.48 m. David cut the hose equally into 6 pieces. What was the length of each piece?



$12.48 \div 6 = 2.08$

The length of each piece was 2.08 m.

Hands-on Activity

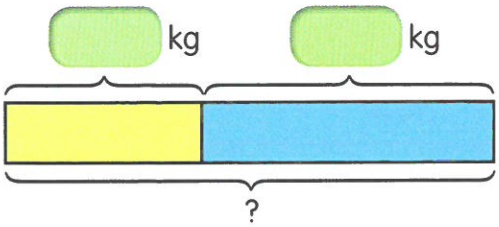
Add and subtract decimals in everyday situations.

Work in groups.

1. During recess, record the prices of your meal and drink in dollars and cents.
2. Find the total amount you paid for your meal and drink.
3. Share the amount you spent with your group.
4. Find the difference between the greatest amount spent and the least amount spent in your group.

Guided Practice

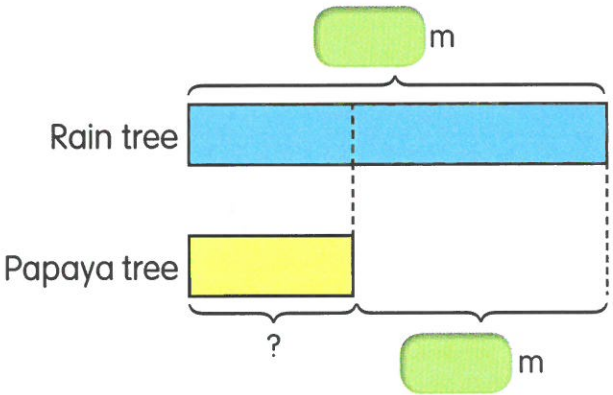
1. Mrs Tan used 1.8 kg of flour and 2.45 kg of sugar to make a cake.
How much flour and sugar did she use altogether?



[ ] [ ] [ ] = [ ]

She used [ ] kg of flour and sugar altogether.

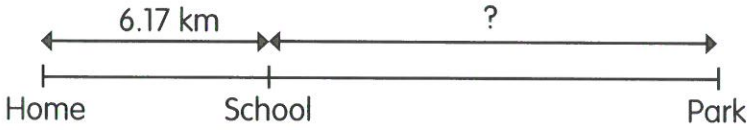
2. The height of a rain tree is 22.63 m.
A papaya tree is 13.85 m shorter than the rain tree.
What is the height of the papaya tree?



[ ] [ ] [ ] = [ ]

The height of the papaya tree is [ ] m.

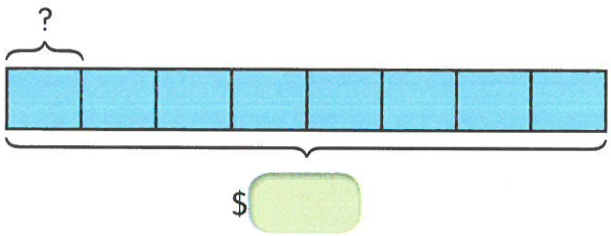
3 Bob travels 6.17 km from his home to his school.
The distance from the school to the park is twice the distance from his home to the school.
How far is the park from the school?



[ ] [ ] [ ] = [ ]

The park is [ ] km away from the school.

4 8 similar packets of chocolate cost $19.20.
Find the cost of 1 packet of chocolate.



$[ ] [ ] [ ] = $[ ]

The cost of 1 packet of chocolate was $[ ].

Workbook B: Practice 1, pages 99–102

Lesson 2

Solving Word Problems (2)

Solving word problems involving decimals

Before you learn ...

Larry had \$12.45. Faridah had \$3.50 more than Larry.
Explain how to find how much Larry and Faridah had altogether.

Learn

1 Jamie stacked 7 similar Mathematics textbooks.
The height of the stack was 5.95 cm.

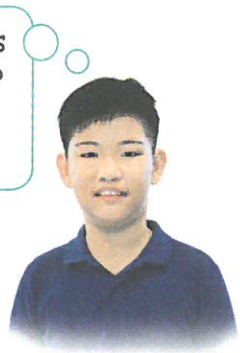
a What was the thickness of each textbook?

b What was the height of a stack of 9 such textbooks?

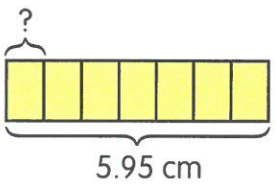
Step 1 What have I gathered from the problem?

Step 2 How do I solve it?
I can draw a model.

Step 3 What do I need to find?
I need to find the thickness of each textbook.
Then, I need to find the height of 9 such textbooks.



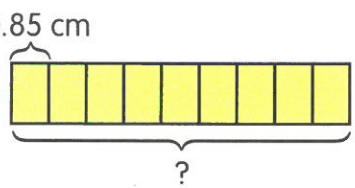
a



$5.95 \div 7 = 0.85$

The thickness of each textbook was 0.85 cm.

b

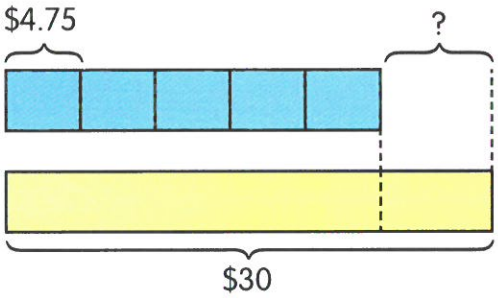


$0.85 \times 9 = 7.65$

The height of a stack of 9 such textbooks was about 7.65 cm.

Step 4 How can I check my answers?
I can work backwards to check if my answers are reasonable.

2 Sophie bought 5 bangles at $4.75 each. She gave the cashier $30. How much change did she receive?



Use the four-step problem-solving method to help you. Then, work backwards to check if your answer is reasonable.

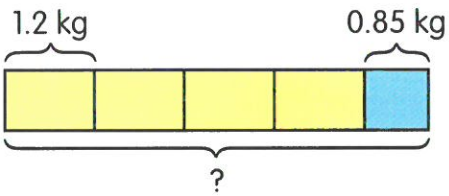
$4.75 × 5 = $23.75

The bangles cost $23.75 altogether.

$30 – $23.75 = $6.25

She received $6.25 change.

3 The mass of a bag of red beans was 1.2 kg. The mass of a bag of kidney beans was 0.85 kg. What was the total mass of 4 such bags of red beans and 1 bag of kidney beans?



1.2 × 4 = 4.8

The mass of 4 such bags of red beans was 4.8 kg.

4.8 + 0.85 = 5.65

The total mass of 4 such bags of red beans and 1 bag of kidney beans was 5.65 kg.

Hands-on Activity

Create word problems.

Work in groups.

1. Write a word problem using the information from the advertisement below.

Example

Adrian had $50.
He wanted to buy the helicopter and the goalpost.
How much more money did he need to buy the two items?

2. Ask your classmates to solve the word problem.

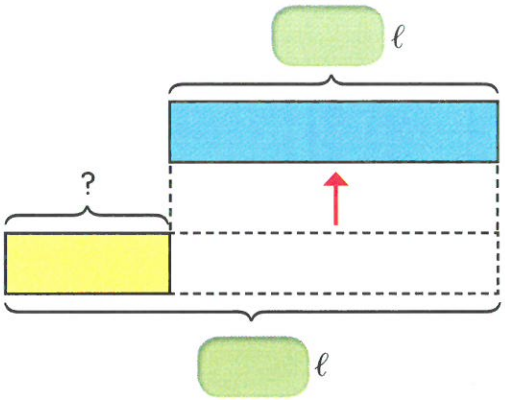
Guided Practice

1 June made 18.4 ℓ of lemonade for a party. Her guests drank 11.38 ℓ of lemonade. She poured the remaining lemonade equally into 3 containers.

(a) How much lemonade did she have left after the party?

(b) How much lemonade did each container contain?

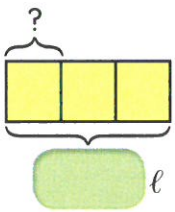
(a)



[ ] [ ] [ ] = [ ]

She had [ ] ℓ of lemonade left after the party.

(b)



[ ] [ ] [ ] = [ ]

Each container contained [ ] ℓ of lemonade.

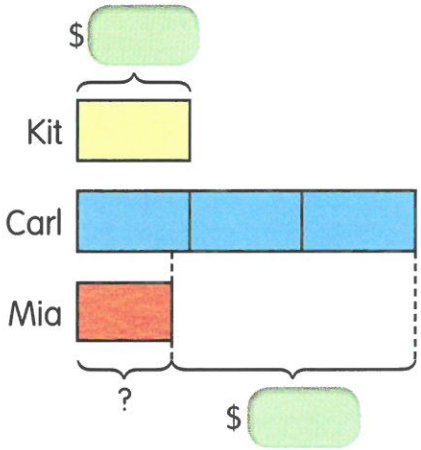
2 Kit saved $12.15. Carl saved 3 times as much as Kit.
Mia saved $24.50 less than Carl. How much money did Mia save?

$ ☐ ○ ☐ = $ ☐

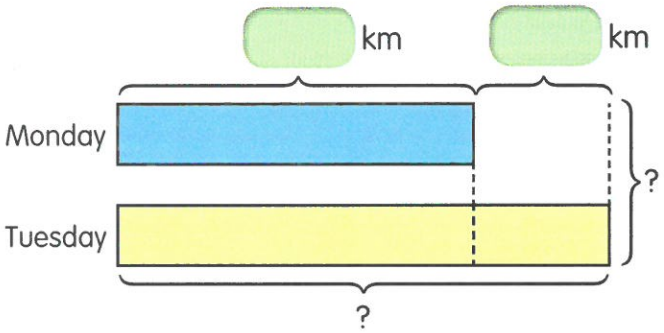
Carl saved $ ☐.

$ ☐ ○ $ ☐ = $ ☐

Mia saved $ ☐.



3 Nathan jogged 4.55 km on Monday. He jogged 1.78 km more on Tuesday than on Monday. What was the distance he jogged on both days?



☐ ○ ☐ = ☐

He jogged ☐ km on Tuesday.

☐ ○ ☐ = ☐

He jogged ☐ km on both days.

Workbook B: Practice 2, pages 103–108

Chapter 12 Review

1. Rachel saved $14.20. She saved $12.90 less than Sarah. How much did Sarah save?

2. Liam drove 15.6 km to a park. He then jogged 2.95 km round the park. What was the difference between the distance he drove and the distance he jogged?

3. Mdm Raihana bought each of her 5 children a pencil case. Each pencil case cost $4.65. How much did she spend on the pencil cases altogether?

4. Mr Kim weighed 52.6 kg. He weighed 4 times as much as his daughter. How much did his daughter weigh?

5. Kalinda bought 4 ℓ of paint.
   She gave the cashier $50 and received $14.20 change.
   a. How much did 4 ℓ of paint cost?
   b. How much did 1 ℓ of paint cost?

6. Maria was 1.55 m tall. She was 0.26 m shorter than Paul. Paul was 0.18 m taller than Ravi.
   a. What was Paul's height?
   b. What was Ravi's height?

7. A blouse cost $45.65 and a skirt cost $31.20.
   Rani bought 2 such blouses and a skirt.
   How much did she spend altogether?

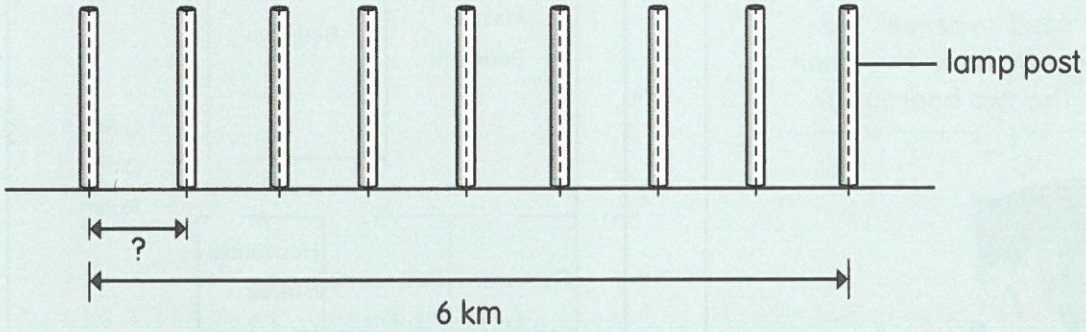
8. The total mass of a clay pot and 2 bags of soil was 13.1 kg.
   When some pebbles were added to the pot, the total mass became 26.84 kg. The mass of the pebbles was 3 times the mass of a bag of soil.
   What was the mass of 1 bag of soil?

Workbook B:
Chapter 12 Review,
pages 109–116
Maths Journal, page 117

Put on Your Thinking Cap!

1. Box A contained 25.4 kg more cherries than Box B. Sarah removed 13.2 kg of cherries from Box B and added them to Box A.
What is the difference between the mass of Box A and the mass of Box B in the end?

2. There are 9 lamp posts along a road 6 km long as shown. All the lamp posts were equal distance from one another. How far apart is the first lamp post from the second lamp post?

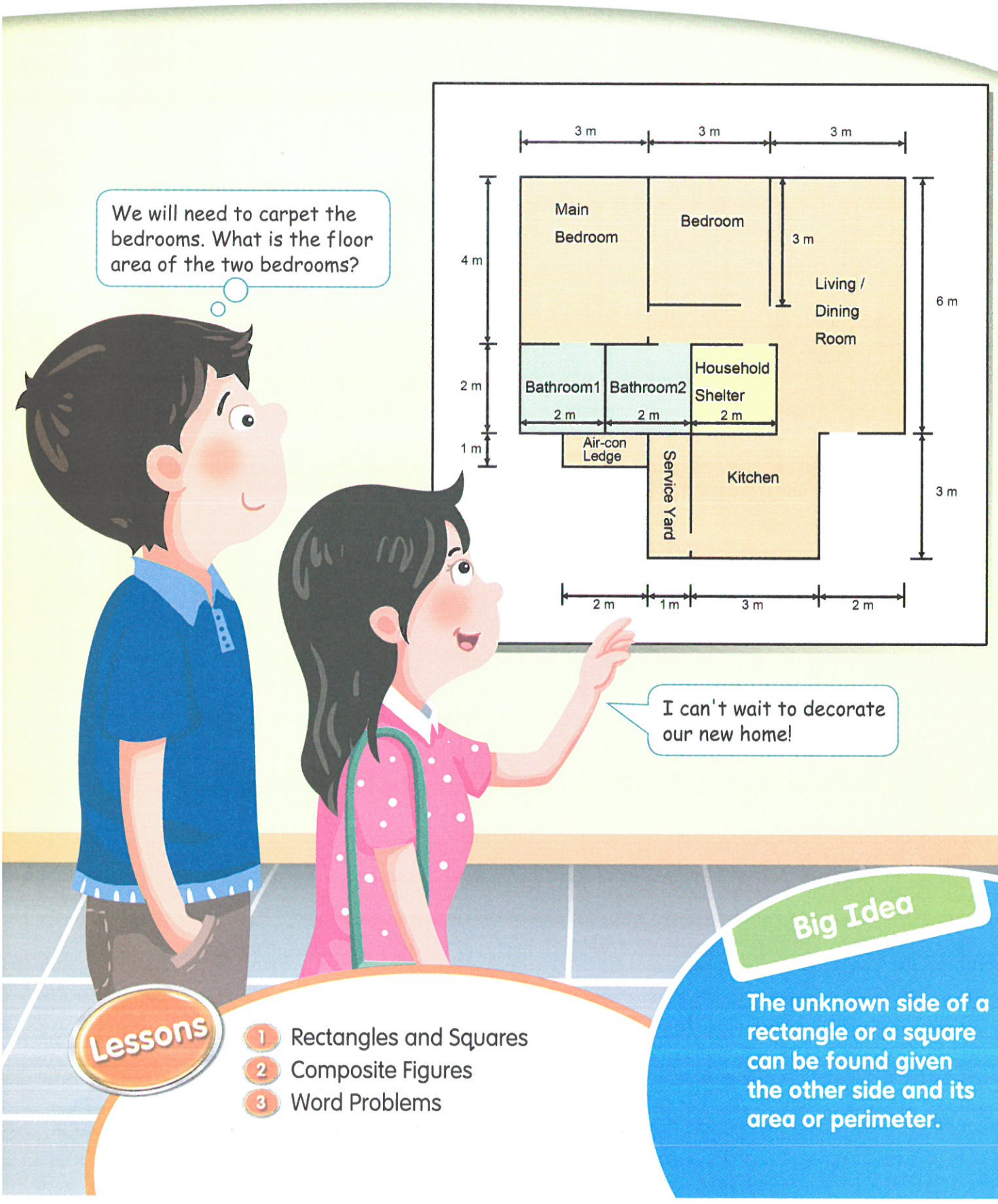


3. Nora has 9 fifty-cent and twenty-cent coins. They add up to a total value of $3.30. How many twenty-cent coins does she have?

Workbook B:
Put on Your Thinking Cap!
page 118

CHAPTER 13

Area and Perimeter



Lessons

1. Rectangles and Squares
2. Composite Figures
3. Word Problems

Big Idea

The unknown side of a rectangle or a square can be found given the other side and its area or perimeter.

Lesson 1

Rectangles and Squares

Finding an unknown side of a rectangle or square with known perimeter

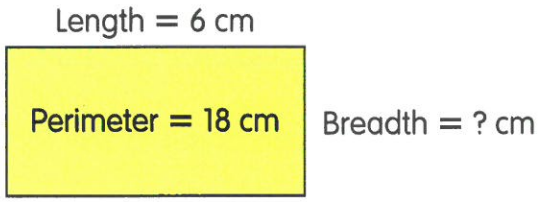
Before you learn ...

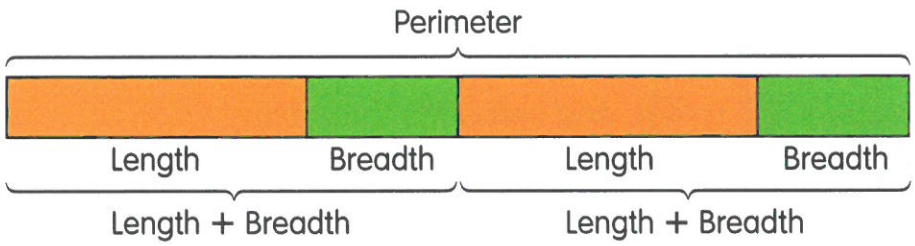
Yi Xuan says that the perimeter of any rectangle or square is always an even number. Is she correct? Explain your answer.

Learn

Find an unknown side of a rectangle with known perimeter

1 Look at the rectangle below. Its perimeter is 18 cm and its length is 6 cm. Find the breadth of the rectangle.





Method 1

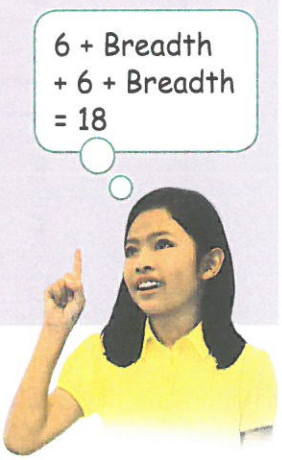
Length + Breadth
= Perimeter ÷ 2
= 18 ÷ 2
= 9 cm

Breadth = 9 − 6
= 3 cm

Method 2

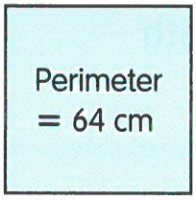
Breadth + Breadth
= 18 − 6 − 6
= 6 cm

Breadth = 6 ÷ 2
= 3 cm



Find an unknown side of a square with known perimeter

2 Look at the square below. Its perimeter is 64 cm. Find the length of a side of the square.



$64 \div 4 = 16$

The length of a side of the square is 16 cm.

Hands-on Activity

Find the unknown side of a rectangle given its perimeter and one known side.

Work in pairs.

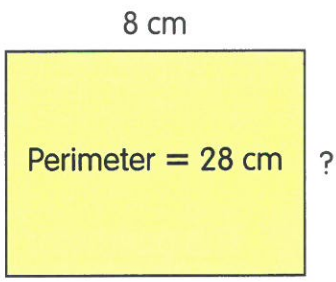
1. Draw a rectangle of length 8 cm and perimeter 30 cm on a 1-cm square grid.
2. Your partner finds the breadth of the rectangle and records it in the table below.
3. Check your partner's answer.
4. Switch roles. Repeat 1 to 3, and complete the table.

Rectangle	Length	Breadth	Perimeter
A	8 cm		30 cm
B	9 cm		30 cm
C	10 cm		30 cm
D	11 cm		30 cm
E	8 cm		24 cm
F	4 cm		16 cm
G	7 cm		28 cm

5. What do you notice about the rectangles F and G?

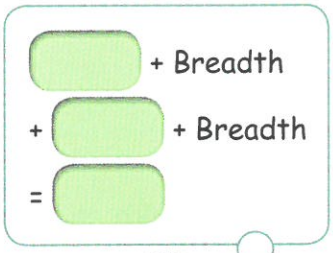
Guided Practice

1 The perimeter of a rectangle is 28 cm.
Its length is 8 cm. Find its breadth.



Method 1

Length + Breadth = Perimeter ÷ ☐
= ☐ ÷ ☐
= ☐ cm
Breadth = ☐ − ☐
= ☐ cm

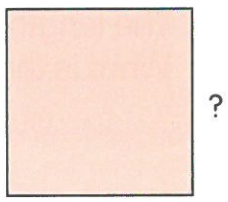


Method 2

Breadth + Breadth
= ☐ − ☐ − ☐
= ☐ cm
Breadth = ☐ ÷ ☐
= ☐ cm

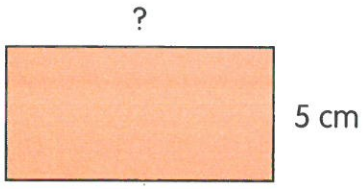
2 Linda bent a wire 132 cm long into a square.
What is the length of a side of the square?

☐ ○ ☐ = ☐

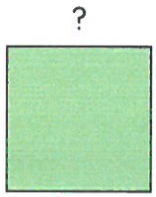


The length of a side of the square is ☐ cm.

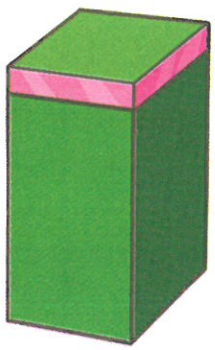
3 The perimeter of a rectangle is 32 cm.
Its breadth is 5 cm.
Find the length of the rectangle.



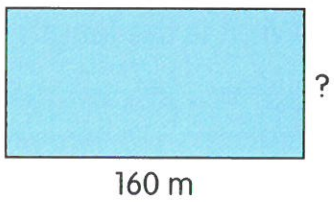
4 The perimeter of a square is 36 cm.
Find the length of one side of the square.



5 Ibrahim sticks a ribbon of length 72 cm round a square-top box. What is the length of one side of the square top?



6 Junie walks 480 m round a rectangular field once.
The length of the field is 160 m.
What is the breadth of the field?



Workbook B: Practice 1, pages 119–120

Finding an unknown side of a rectangle or square with known area

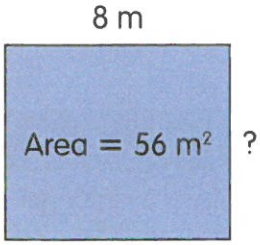
Before you learn ...

Angeline says the areas of squares are special numbers. Can you list down the areas? What do you notice about these numbers?

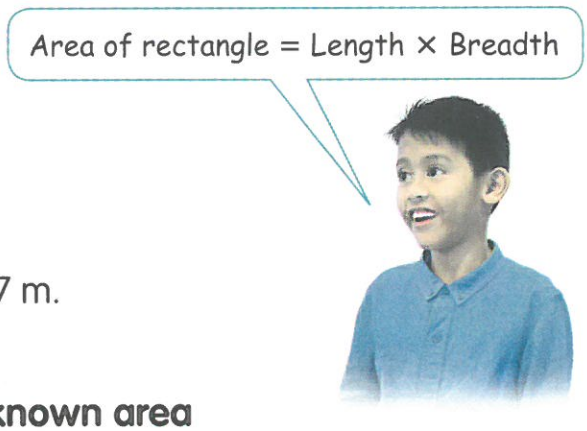
Learn

Find an unknown side of a rectangle with known area

1 The area of a rectangular lawn is 56 m^2. Its length is 8 m. Find its breadth.



$56 \div 8 = 7$



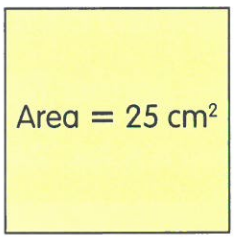
The breadth of the rectangular lawn is 7 m.

Find an unknown side of a square with known area

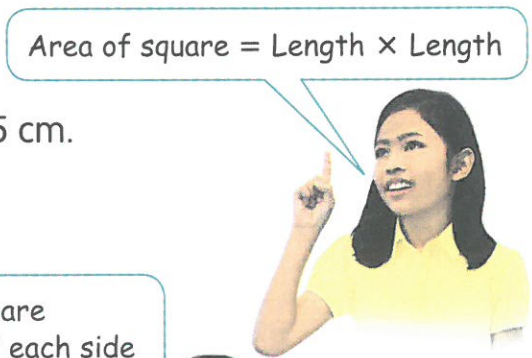
2 The area of a square is 25 cm^2.

a Find the length of a side of the square.

b Find the perimeter of the square.

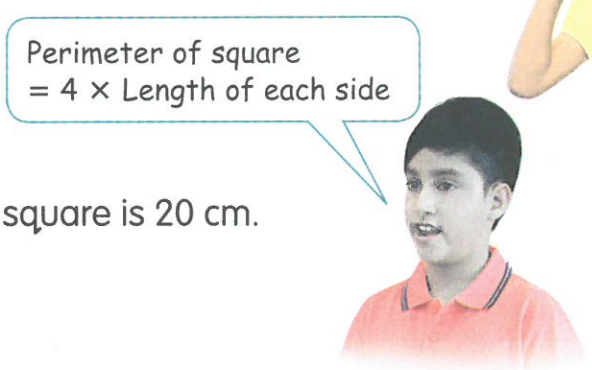


a $25 = 5 \times 5$



The length of a side of the square is 5 cm.

b $4 \times 5 = 20$



The perimeter of the square is 20 cm.

Hands-on Activity

Work in pairs.

Station 1 Find the unknown side of a rectangle given its area and one known side.

1. Draw a rectangle of length 4 cm and area 12 cm^2 on a 1-cm square grid.
2. Your partner finds the breadth of the rectangle and records it in the table below.
3. Check your partner's answer.
4. Switch roles. Repeat 1 to 3, and complete the table.

Rectangle	Length	Breadth	Area
A	4 cm		12 cm^2
B	8 cm		48 cm^2
C	6 cm		30 cm^2

Station 2 Draw and cut squares of different sizes and find their areas.

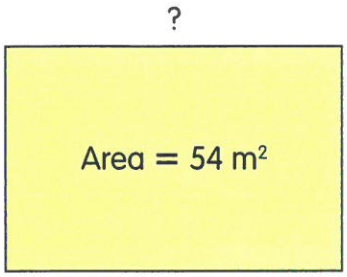
1. Draw and cut a square of sides 1 cm.
2. Your partner finds the area of the square in 1.
3. Switch roles. Repeat 1 and 2, and complete the table.

Side of Square	Area of Square
1 cm	
2 cm	
3 cm	
4 cm	
5 cm	
6 cm	
7 cm	
8 cm	
9 cm	
10 cm	

Guided Practice

1. The perimeter of a rectangular garden is 28 m. Its length is 8 m.
   Find its breadth. ☐

2. The area of a rectangular playground is 54 m^2. Its breadth is 6 m.
   Find its length.

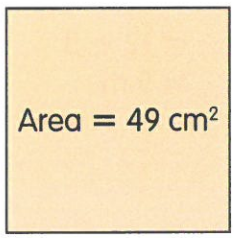


☐ ☐ ☐ = ☐

The length of the rectangular playground is ☐.

3. The perimeter of a square garden is 24 m.
   a. Find the length of its side. ☐
   b. Find the area of the garden. ☐

4. The area of a square is 49 cm^2.
   a. Find the length of a side of the square.
   b. Find the perimeter of the square.



a. 49 = ☐ × ☐

The length of a side of the square is ☐.

b. 4 × ☐ = ☐

The perimeter of the square is ☐.

Workbook B: Practice 2, pages 121–124

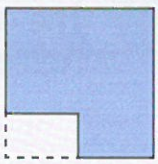
Lesson 2

Composite Figures

Finding the perimeter and the area of a composite figure

Before you learn ...

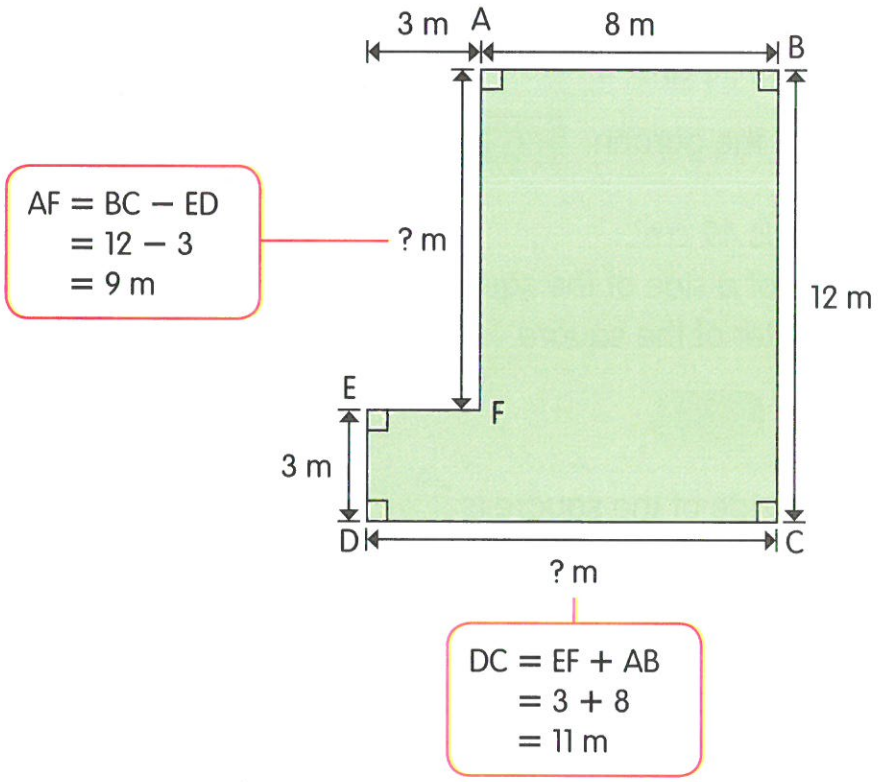
Cut out a rectangle from the corner of a piece of square paper.
How would you find the perimeter and area of the remaining figure?



Learn

Find the perimeter of a composite figure

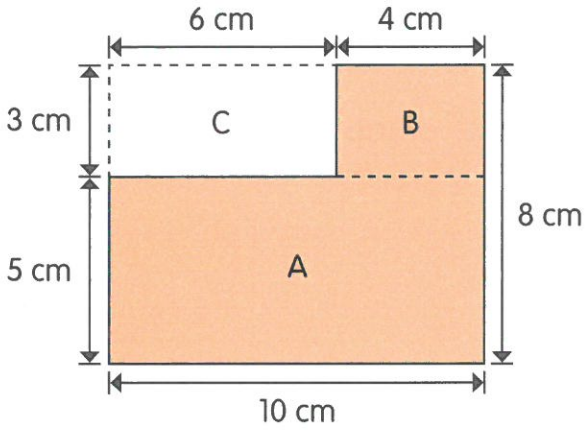
1 Mr Lee wants to put up a fence round a piece of land as shown.
What is the perimeter of the land?

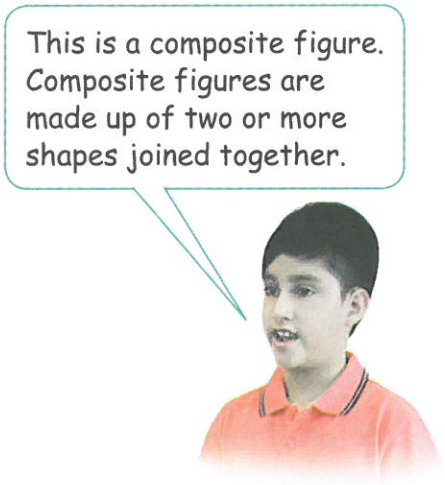


Perimeter of land = AB + BC + CD + DE + EF + FA
= 8 + 12 + 11 + 3 + 3 + 9
= 46 m

Find the area of a composite figure

2 Rectangle C is cut out from a rectangular cardboard measuring 10 cm by 8 cm. Find the area of the remaining cardboard.





Method 1

Area of remaining cardboard = Area of A + Area of B

Area of A = 10 × 5
= 50 cm^2

Area of B = 4 × 3
= 12 cm^2

Area of remaining cardboard = 50 + 12
= 62 cm^2

Method 2

Area of remaining cardboard = Area of cardboard − Area of C

Area of cardboard = 10 × 8
= 80 cm^2

Area of C = 6 × 3
= 18 cm^2

Area of remaining cardboard = 80 − 18
= 62 cm^2

Hands-on Activity

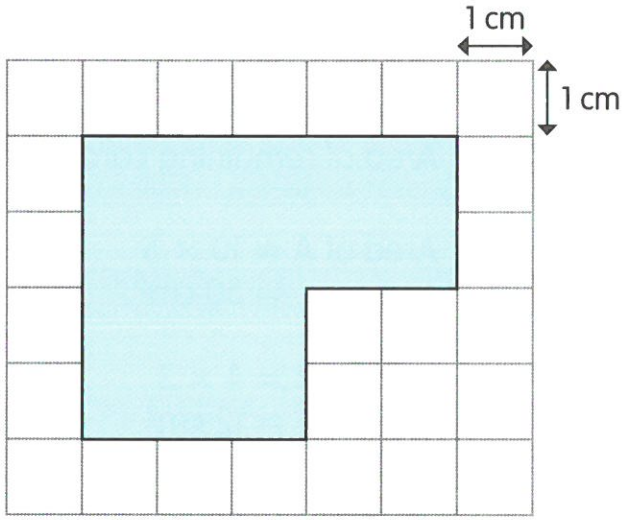
Work in pairs.

Station 1 Form a composite figure and find its area and perimeter.

1. Use cut-outs provided by your teacher to form composite figures.
2. Your partner finds the area and perimeter of the composite figure you have formed.
3. Switch roles. Repeat 1 and 2.

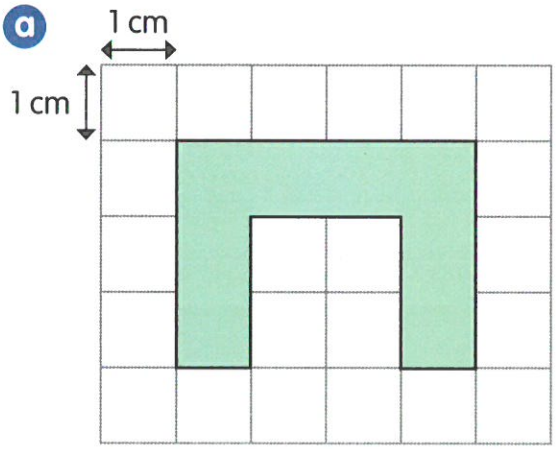
Station 2 Find the area and perimeter of a composite figure by cutting it into rectangles and squares.

1. Copy the figure on the right onto a 1-cm square grid paper.
2. Find the perimeter of the figure.
3. Use Method 1 on page 139 to find its area.
4. Your partner checks your answer using Method 2 on page 139.

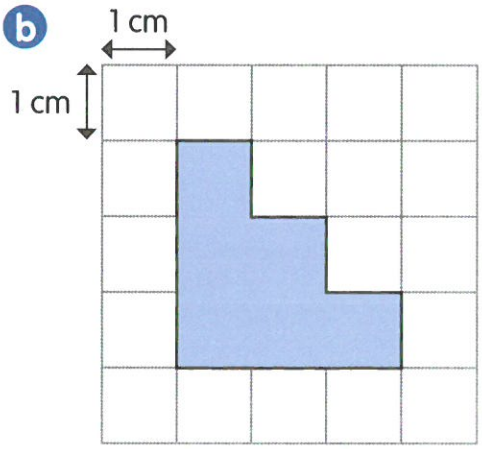


5. Switch roles. Repeat 1 to 4 with the following figures.

a

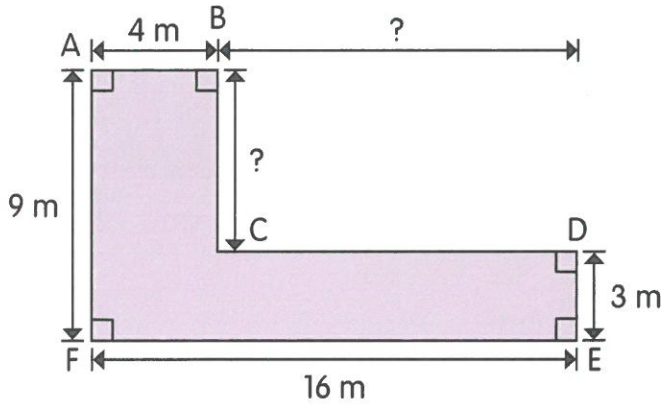


b



Guided Practice

1 Find the perimeter of the figure.



BC = AF − DE

= ☐ m

CD = ☐ m

Perimeter of figure = ☐ m

2 A smaller square is cut out from a bigger square. Find the area of the shaded part.

Method 1

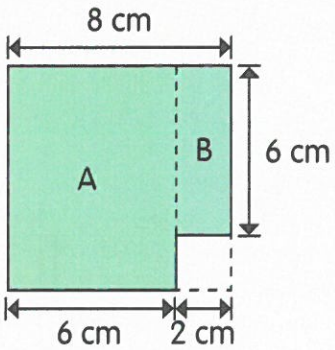
Area of shaded part = Area of ☐ + Area of ☐

Area of ☐ = ☐ ○ ☐

= ☐ cm^2

Area of ☐ = ☐ ○ ☐

= ☐ cm^2



Area of shaded part = ☐ ○ ☐

= ☐ cm^2

Method 2

Area of shaded part = Area of bigger square − Area of smaller square

Area of bigger square = [ ] [ ] [ ]

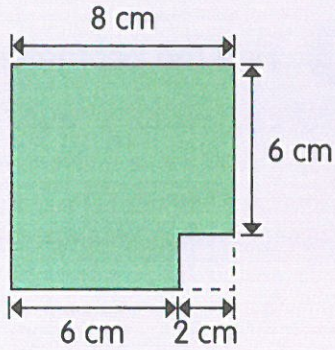
= [ ] cm^2

Area of smaller square = [ ] [ ] [ ]

= [ ] cm^2

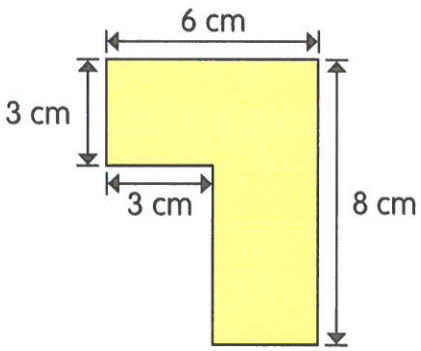
Area of shaded part = [ ] [ ] [ ]

= [ ] cm^2

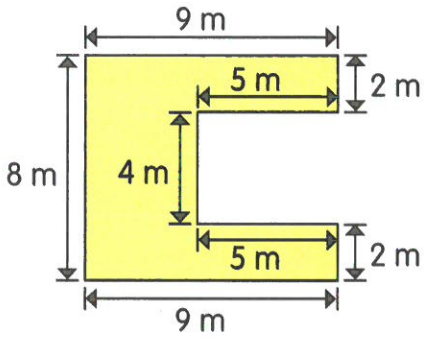


3 Find the perimeter and area of each figure. (All lines meet at right angles.)

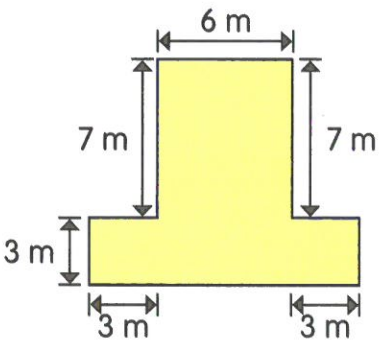
a



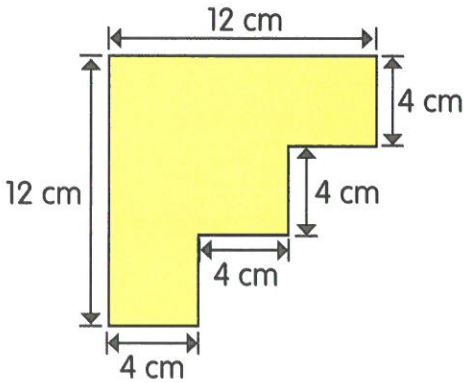
b



c



d



Workbook B: Practice 3, pages 125–128

Lesson 3

Word Problems

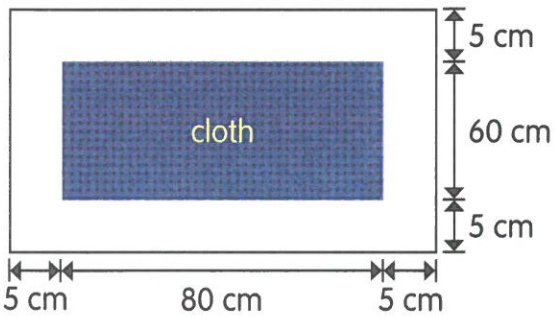
Solving word problems

Before you learn ...

You want to put a 1-cm black border round a family photo that measures 8 cm by 10 cm. How much black paper would you need to create the border?

Learn

1 A rectangular piece of cloth measures 80 cm by 60 cm. When it is placed on a rectangular table, it leaves a margin 5 cm wide all round it. Find the area of the table **not** covered by the cloth.



Length of table = 5 + 80 + 5
= 90 cm

Breadth of table = 5 + 60 + 5
= 70 cm

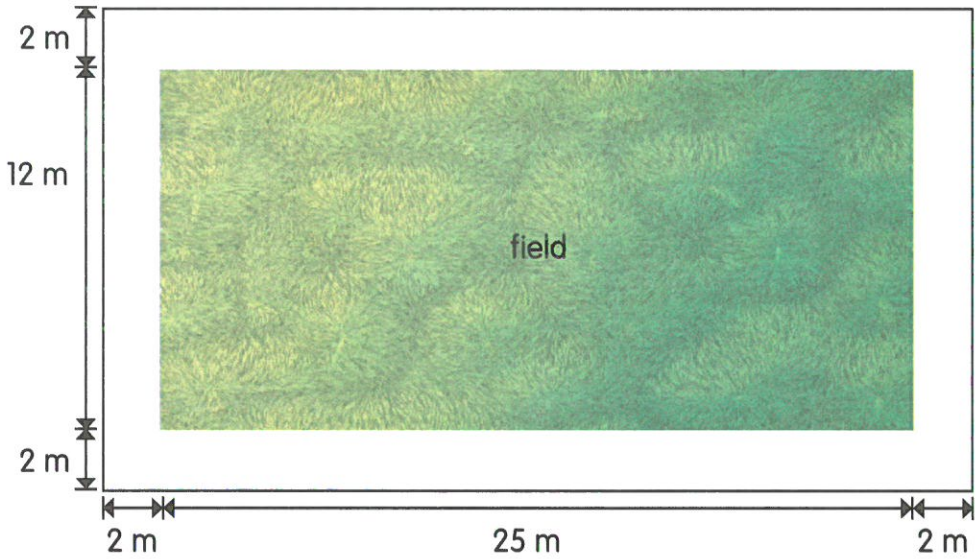
Area of table = 90 × 70
= 6300 cm^2

Area of cloth = 80 × 60
= 4800 cm^2

Area of table not covered by cloth = 6300 − 4800
= 1500 cm^2

Guided Practice

1 The figure shows a rectangular field with a path 2 m wide round it. Find the area of the path.



Length of big rectangle = ☐ ○ ☐ ○ ☐

= ☐ m

Breadth of big rectangle = ☐ ○ ☐ ○ ☐

= ☐ m

Area of big rectangle = ☐ ○ ☐

= ☐ m^2

Area of small rectangle = ☐ ○ ☐

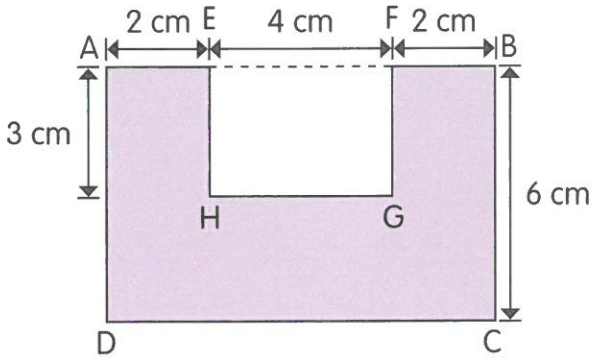
= ☐ m^2

Area of path = ☐ ○ ☐

= ☐ m^2

Area of path
= Area of big rectangle
- Area of small rectangle

2 The figure shows a rectangle EFGH cut out from a large rectangle ABCD. Find the area of the shaded part of the figure.



Length of big rectangle = ☐ ● ☐ ● ☐

= ☐ cm

Breadth of big rectangle = ☐ cm

Area of big rectangle = ☐ ● ☐

= ☐ cm^2

Area of small rectangle = ☐ ● ☐

= ☐ cm^2

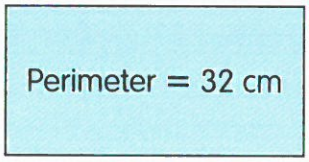
Area of shaded part = ☐ ● ☐

= ☐ cm^2

Workbook B:
Practice 4
pages 129–134

Chapter 13 Review

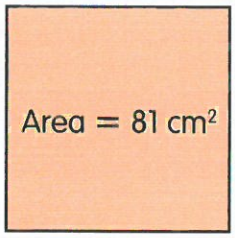
1 Find the unknown length and area of the rectangle.



Length = ____ cm

Area = ____ cm^2

2 Find the unknown side and perimeter of the square.

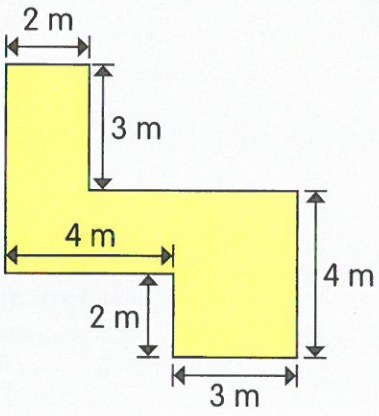


Length = ____ cm

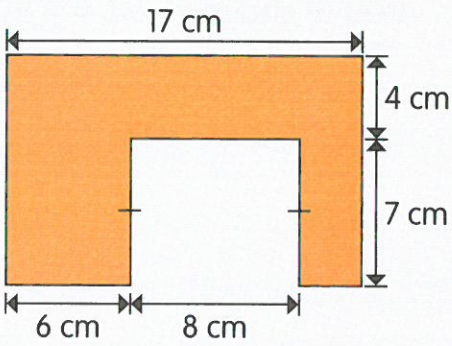
Perimeter = ____ cm

3 Find the area and perimeter of each of the following figures.
(All lines meet at right angles.)

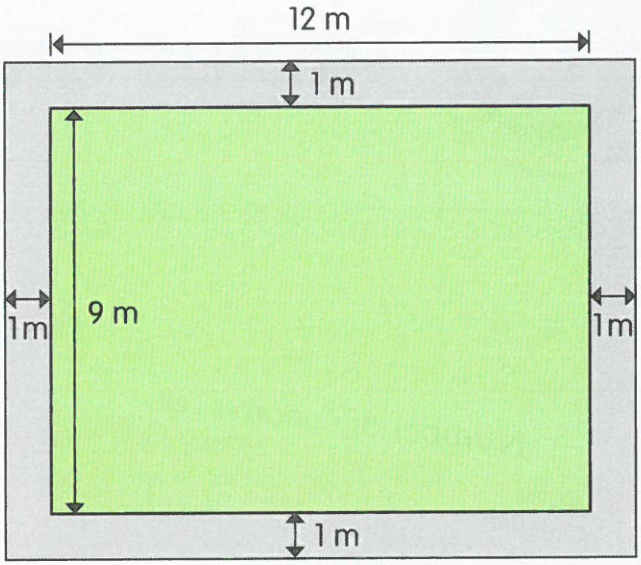
(a)



(b)



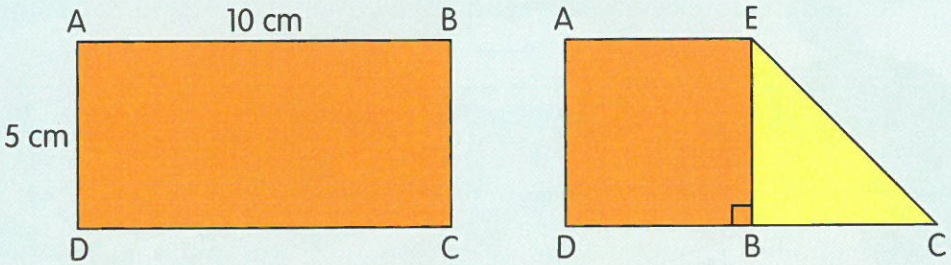
4 Mario's rectangular garden measures 12 m by 9 m. He filled up a 1-m pathway round the border of his garden with pebbles. What is the area covered by the pebbles?



Workbook B:
Chapter 13 Review, pages 135–141
Maths Journal, page 142

Put on Your Thinking Cap!

1 A rectangular piece of paper is folded at one of its corners such that the side BC lies along the side CD as shown.



a What is the area of the rectangle before it was folded?

b Find the area of the figure after the paper was folded.

2 The side of a small square is 5 cm. 36 such small squares form a large square. What is the area of the large square?

3 Lily formed a rectangle using a 72 cm long wire. The length of the rectangle is twice its breadth. What is the area of the rectangle?

Workbook B:
Put on Your Thinking Cap! pages 143–144
Review 6, pages 145–150

CHAPTER 14

Tables and Line Graphs

Lessons

1. Tables
2. Line Graphs

Big Idea

Tables and line graphs are different ways to present information.

Lesson 1

Tables

Presenting and interpreting data in a table

Before you learn ...

Carry out a survey in your class. Find out the favourite sport of each pupil. Present the data collected in a table.

Learn

1 Mr Quek recorded the favourite subjects and sports of several pupils on cards.

Adam Mathematics Soccer	**Ralph** English Soccer	**Christine** Mathematics Badminton
Yu Qi Science Badminton	**Baoqing** Mathematics Badminton	**Jannah** English Badminton
Ali Mathematics Basketball	**Eve** Mathematics Badminton	**Carina** Mathematics Basketball

He represented the data for the favourite subjects in a table like this:

Favourite Subject	Tally	Number of Pupils
Mathematics	𝍸 |	6
English	||	2
Science	|	1

(a) The least popular subject is Science.

(b) 2 pupils chose English as their favourite subject.

(c) The most popular subject is Mathematics.

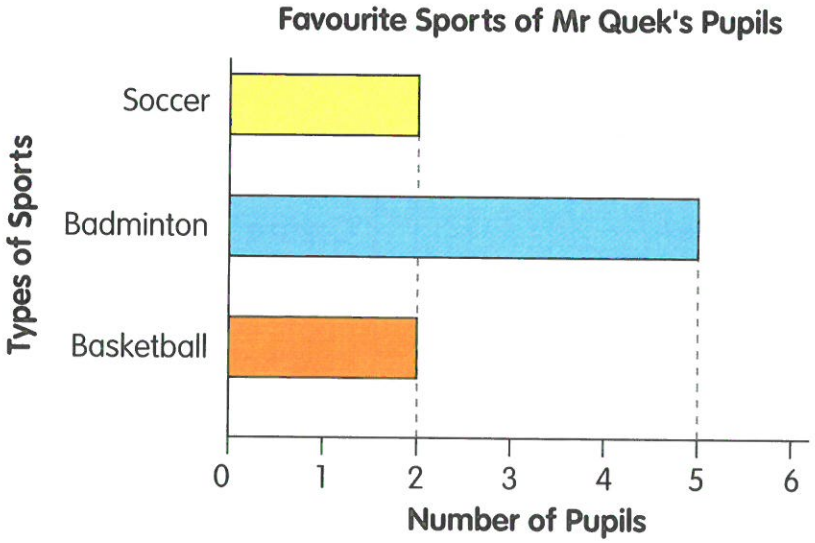
(d) 4 more pupils like Mathematics than English.

(e) 9 pupils were surveyed.

We can also present a table in this way. The following table represents the favourite sports of Mr Quek's pupils.

Favourite Sport	Soccer	Badminton	Basketball
Tally	||	𝍸	||
Number of Pupils	2	5	2

He drew a bar graph to represent the data in the table.



2 The table shows the number of pupils in a primary school.
What are the missing data in the table?
Then, answer the questions that follow.

Level	Boys	Girls	Total Number of Pupils
Primary 1	160	220	380
Primary 2	?	230	420
Primary 3	210	190	400
Primary 4	170	250	420
Primary 5	250	200	?
Primary 6	160	?	280

a How many boys are there in Primary 2?
There are 190 boys in Primary 2.

b How many girls are there in Primary 6?
There are 120 girls in Primary 6.

c How many more boys than girls are there in Primary 3?
There are 20 more boys than girls in Primary 3.

d What is the total number of pupils in Primary 5?
There are 450 pupils in Primary 5.

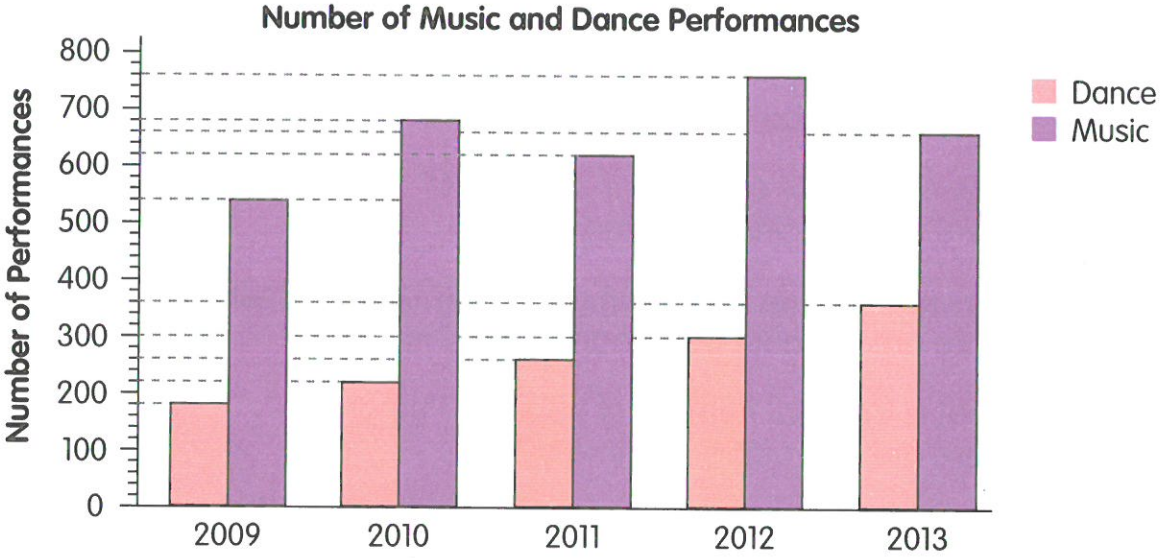
Hands-on Activity

Explain why data is presented in a graph instead of a table.

Work in groups.

1. Study the table and bar graph below.
The table shows the number of music and dance performances from 2009 to 2013.

Year	2009	2010	2011	2012	2013
Dance	180	220	260	300	360
Music	540	680	620	760	660



2. Look at the table and the bar graph. Is it easier to use the data in the graph or in the table to compare the number of performances? Explain.

3. Find an example of a similar bar graph in 1 from newspapers, magazines or utility bills.

4. Discuss with your group the possible ways the data was collected and how the bar graph was created.

Guided Practice

1. At a class picnic, pupils brought different kinds of food. Each pupil brought one food item. The table shows the number of food items the pupils brought. Complete the table.

Food Item	Burger	Chicken Nugget	Fried Noodle	Salad	Others
Tally	𝍸	𝍸	𝍸 ||	|||	𝍸 |
Number of Pupils	4				

   a. How many pupils brought chicken nuggets?

   b. Which food item did most pupils bring?

   c. How many more pupils brought fried noodles than burgers?

   d. How many pupils were at the picnic?

2. The table shows the fruits Lili bought.

Type of Fruit	Number of Fruits
Apple	10
Orange	20
Durian	3
Pineapple	4
Mango	9

   a. How many oranges did Lili buy?

   b. Which type of fruit did Lili buy the least?

   c. How many more mangoes than pineapples did Lili buy?

3 The table shows the sales of buns and croissants at each store during a school funfair.

Each bun was sold at 30 cents and each croissant was sold at 80 cents.

Complete the table to find the total amount collected by all the stores.

Store	Bun (30¢ each)		Croissant (80¢ each)		Total Amount ($)
	Number of Buns Sold	Amount Collected	Number of Croissant Sold	Amount Collected	
A	20	$6.00	20	$16.00	$22.00
B	25	$7.50	10	$8.00	$15.50
C	12	$3.60	5	$4.00	$7.60
D	30	$9.00	15		$21.00
Total	87		50	$40.00	

a Which store collected the most amount of money?

b Which store collected the least amount of money?

c Which store sold the same number of buns and croissants?

d How much more money did Store B collect from the sale of croissants than buns?

e How much more money did Store C collect from the total sale than Store D?

Workbook B: Practice 1, pages 151–154

Lesson 2

Line Graphs

Interpreting a line graph

Before you learn ...

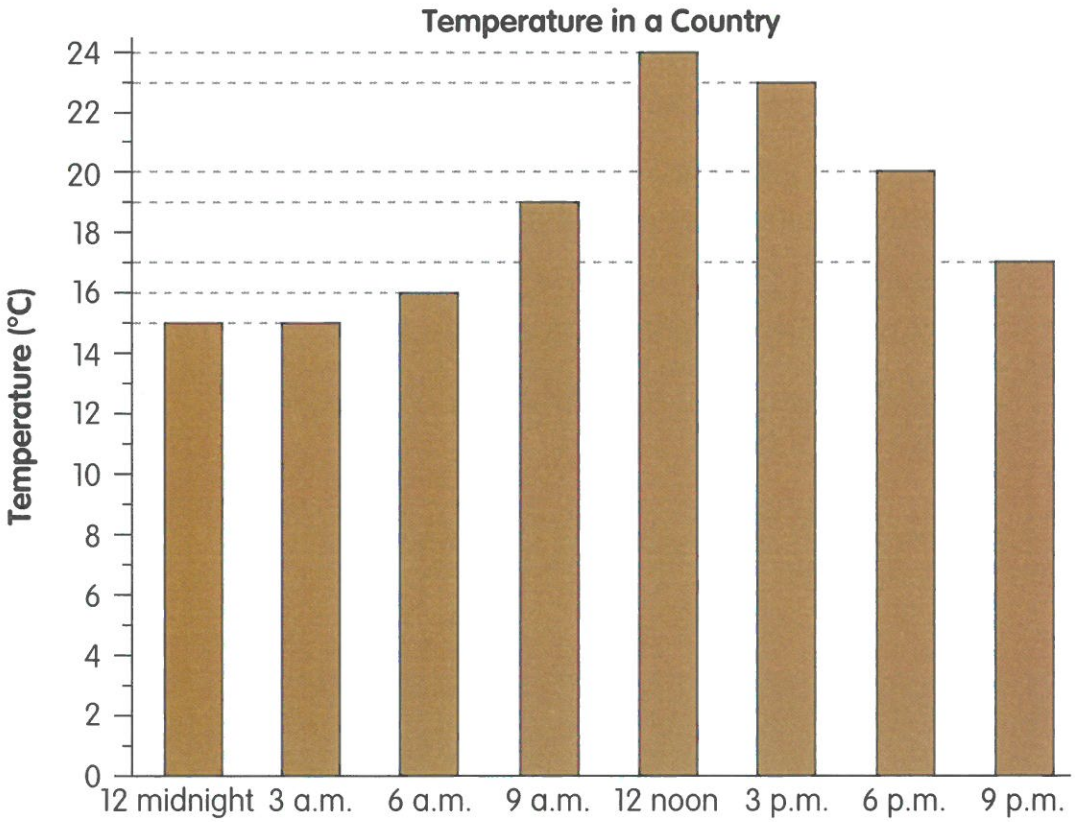
Carry out a survey in your class. Find the number of books read by your class from January to May. Make a line graph to show the information.

Learn

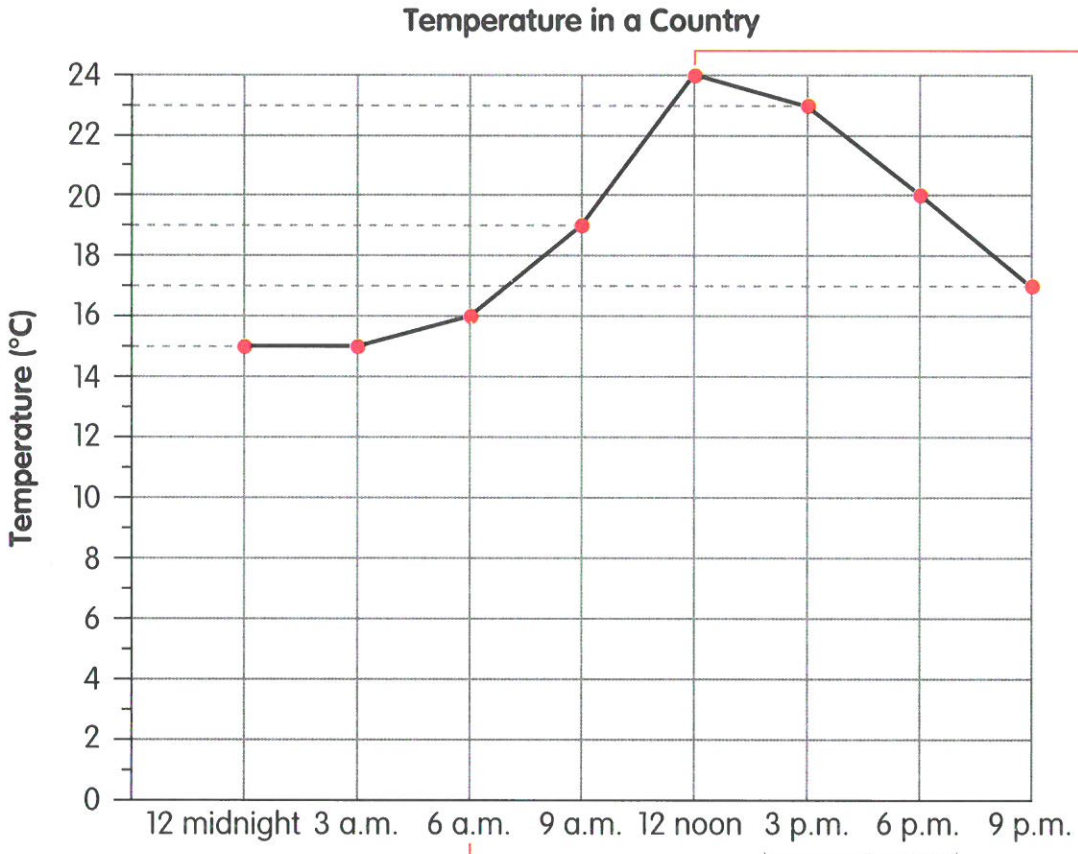
1 The table shows the temperature recorded in a country at 3-h intervals on a day.

Time	12 midnight	3 a.m.	6 a.m.	9 a.m.	12 noon	3 p.m.	6 p.m.	9 p.m.
Temperature (°C)	15	15	16	19	24	23	20	17

The data in the table can be represented in a bar graph.



We can also represent the data in a line graph.



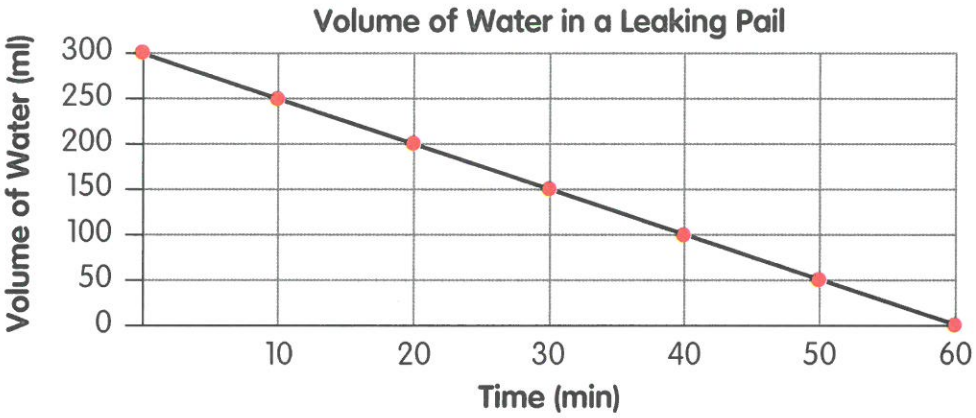
(a) What was the temperature at 6 a.m.?
The temperature was 16°C.

(b) What was the difference in the temperature between 3 p.m. and 6 p.m.?
The difference in the temperature was 3°C.

(c) What was the highest temperature recorded?
The highest temperature recorded was 24°C.

(d) At what time was the temperature of 19°C recorded?
The time was 9 a.m.

2 The line graph shows the volume of water in a leaking pail over 60 minutes.

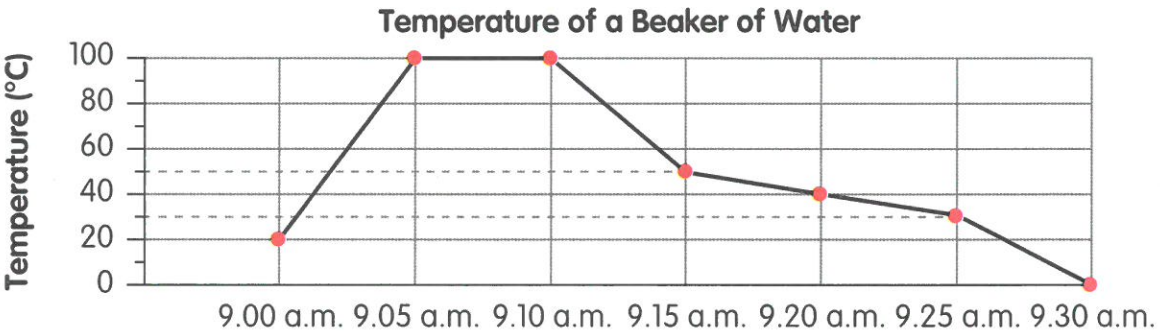


a What was the volume of water in the pail at first?
The volume of water in the pail was 300 ml at first.

b What was the volume of water in the pail 20 minutes after it started leaking?
The volume of water in the pail 20 minutes after it started leaking was 200 ml.

c How long did it take for the pail to be completely empty?
It took 60 minutes for the pail to be completely empty.

3 The line graph shows the change in temperature of a beaker of water over 30 minutes.



a What was the temperature of the water at 9.15 a.m.?
The temperature of the water was 50°C at 9.15 a.m.

b How long did the temperature remain unchanged at 100°C?
The temperature remained unchanged at 100°C for 5 minutes.

c What was the difference in temperature between 9.20 a.m. and 9.30 a.m.?
The difference in temperature was 40°C.

Hands-on Activity

Station 1 Use graphing tools to construct graphs.

Work in pairs.

1. Look at the table.

Age	0	2	4	6	8	10
Height (cm)	52	89	108	118	136	150

Use a graphing tool in the computer to present the data in

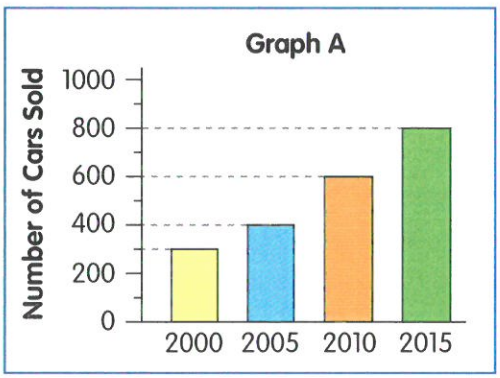
(a) a line graph. (b) a bar graph.

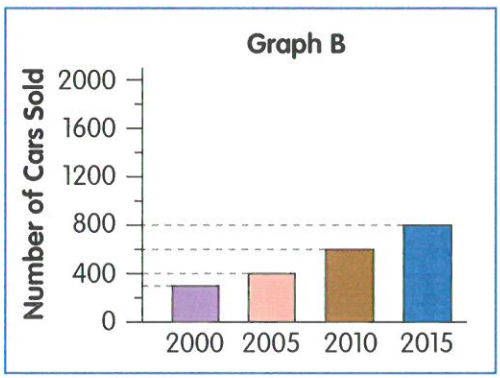
2. Study your graphs. Which of the graphs is more suited to present the data? Why?

3. (a) Discuss when a line graph is used to represent information.
(b) Discuss when a bar graph is used to represent information.

Station 2 Discuss misleading representation of data.

1. Look at the graphs below. They show the number of cars sold by a local dealer in four different years.



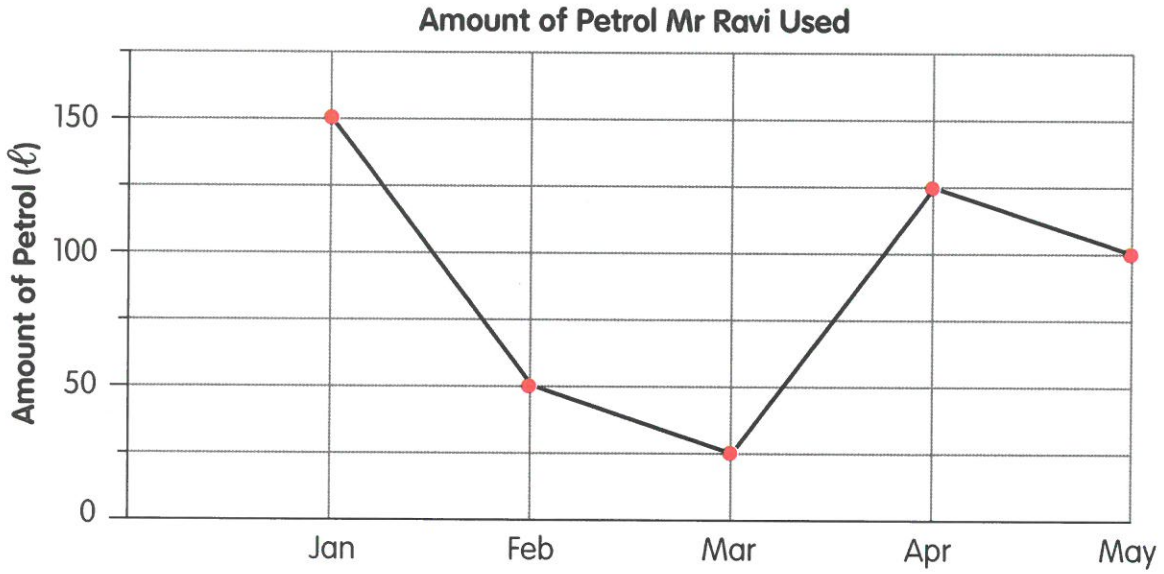


2. (a) Why do the graphs look different?
(b) Which graph appears to show that more cars were sold in the four different years? Why?

3. Look for more examples of such misleading graphs in newspapers and magazines. Discuss how they are misleading.

Guided Practice

1. The line graph shows the amount of petrol Mr Ravi used from January to May.



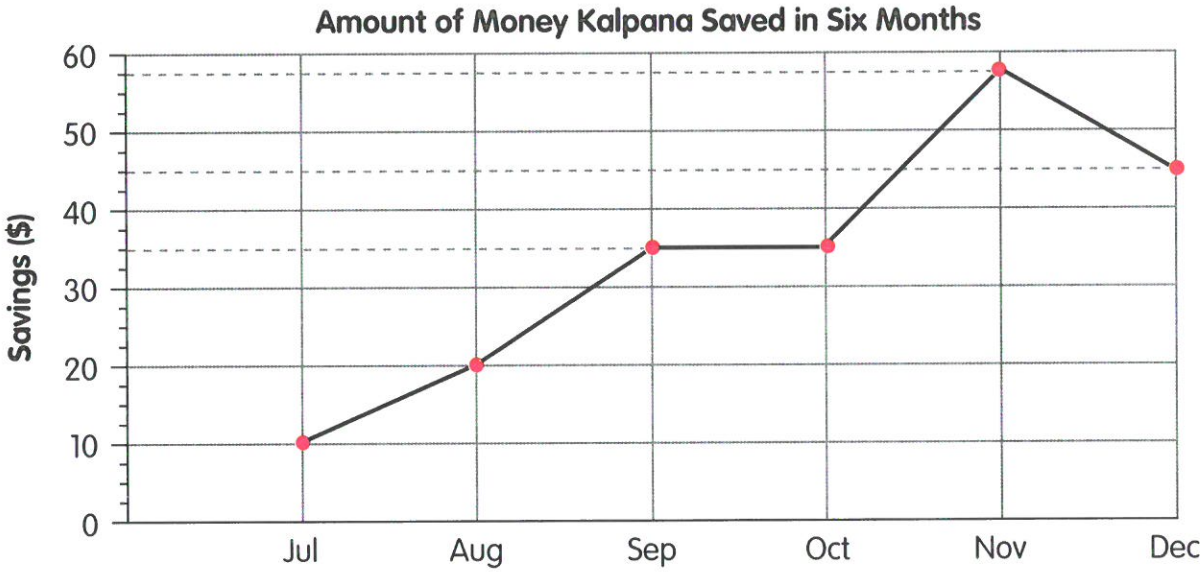
a. Which month did Mr Ravi use 50 ℓ of petrol?

b. Which month did Mr Ravi use the greatest amount of petrol?

c. What was the increase in the amount of petrol used from March to April?

d. What was the total amount of petrol used in the five months?

2 The line graph shows the amount of money Kalpana saved at the end of each month from July to December.



a) How much did Kalpana save in July?

b) Which month did she save twice as much money as July?

c) Which two months did she save the same amount?

d) Which month did she save the most?

e) How much did she save from October to December altogether?

Workbook B: Practice 2, pages 155–160

Chapter 14 Review

1 The table shows the number of teachers and pupils in a school. Complete the table.

	Male	Female	Total
Number of Teachers	86	107	193
Number of Pupils	902		1763
Total	988	968	1956

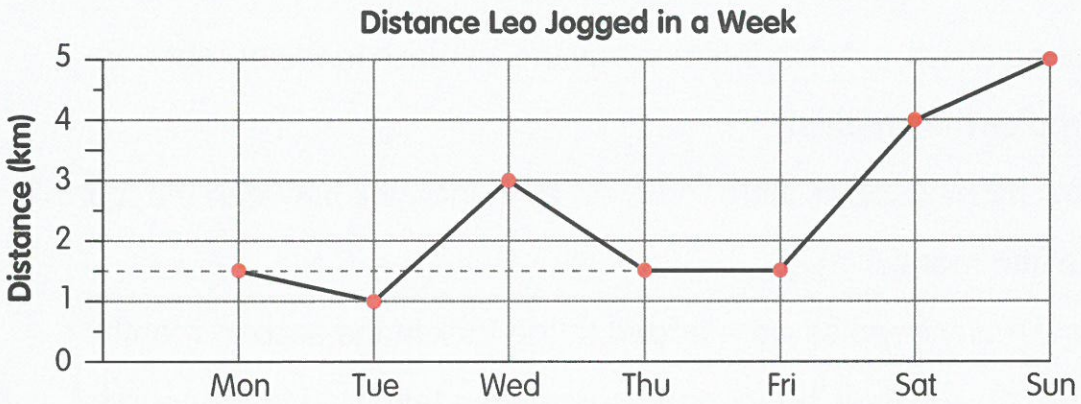
a) How many male pupils were there?

b) What is the total number of teachers and pupils?

c) How many teachers were there?

d) Were there more male or female pupils?
How many more?

2 The line graph shows the distance Leo jogged in a week.



a) Which day did Leo jog the greatest distance?

b) Which day did Leo jog the shortest distance?

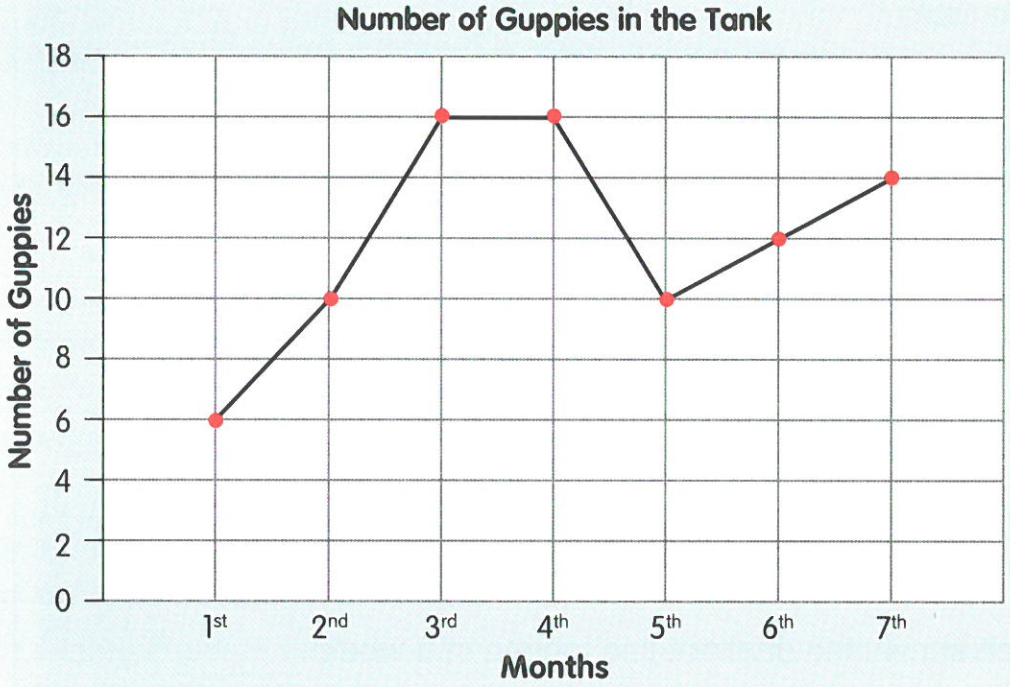
c) Which day did Leo jog twice as far as he did on Thursday?

d) What is the difference between the distance Leo jogged on Wednesday and on Sunday?

Workbook B:
Chapter 14 Review, pages 161–162
Maths Journal, page 163

Put on Your Thinking Cap!

The graph shows the number of guppies in a tank over a few months.



(a) During which 1-month interval was the increase in the number of guppies the greatest?

(b) How many guppies were removed from the tank between the fourth and the fifth month?

(c) How many guppies were added to the tank in the second month?

(d) What do you think happened between the third and fourth month?

Workbook B:
Put on Your Thinking Cap!
page 164

CHAPTER 15

Time

Lessons

1. Seconds
2. 24-Hour Clock

Big Idea

Time can be expressed in different units of measurement.

Lesson 1

Seconds

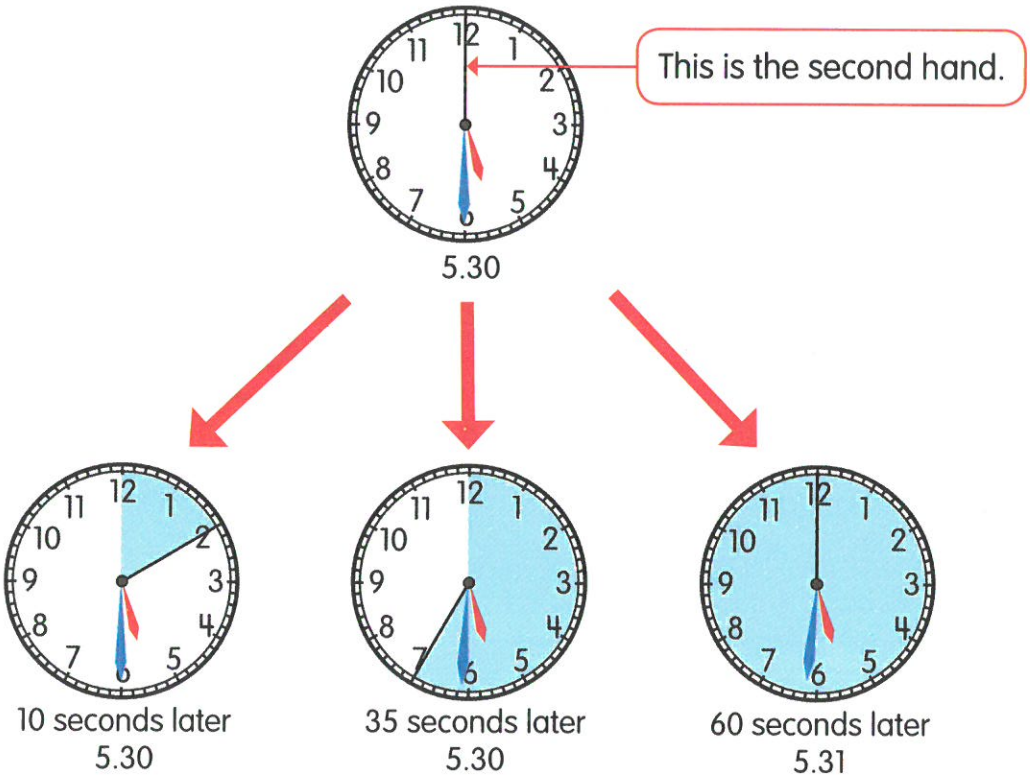
Measuring time in seconds

Before you learn ...

How many times do you think you can write your name in 10 seconds?
Make a guess and check how accurate your guess is.

Learn

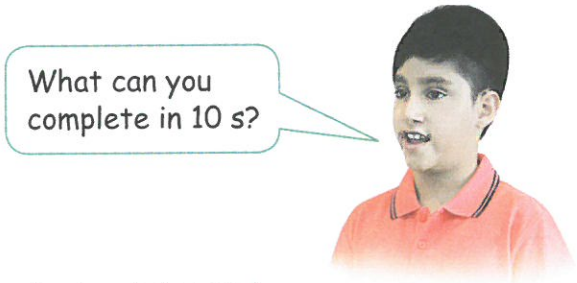
1 The **second** is a unit of measurement for time.
We use **s** to stand for seconds.



60 seconds = 1 minute

2 Raj walks from one end of a classroom to the other. Mr Tang times him.

Raj takes 10 s to walk from one end of the classroom to the other.



Hands-on Activity

Identify activities that can be done in 1 second.

Work in pairs.

1 Estimate whether each activity in the table would take 1 s, more than 1 s or less than 1 s.

2 Your partner measures the time you take to complete each activity.

3 Switch roles. Repeat 1 and 2.

Activity	1 s	More than 1 s	Less than 1 s
Say "thirty-four"			
Blink once			
Raise your hand			
Nod twice			
Say your full name			

Lesson 2

24-Hour Clock

Reading and writing time with a 24-hour clock

Before you learn ...

Roy has to return home by 11.59 p.m. which is 1 minute to midnight. What is another way to write 11.59 p.m.?

Learn 1

Amy woke up.

6.00 a.m. 7.30 a.m.

12-hour clock

midnight a.m.

12 1 2 3 4 5 6 7 8 9 10 11

00 00 01 00 02 00 03 00 04 00 05 00 06 00 07 00 08 00 09 00 10 00 11 00

24-hour clock

a.m. and **p.m.** are not used in 24-hour clocks.

08 15

hours minutes

06 00 07 30

Amy reached school.

Read as **zero six hundred hours.**

Read as **zero seven thirty hours.**

Amy went home.

Amy had dinner.

1.30 p.m. 4.15 p.m. 7.45 p.m. 9.50 p.m.

noon p.m. midnight

12 1 2 3 4 5 6 7 8 9 10 11 12

12 00 13 00 14 00 15 00 16 00 17 00 18 00 19 00 20 00 21 00 22 00 23 00 00 00

13 30 16 15 19 45 21 50

Amy went swimming.

Amy went to bed.

Read as **nineteen forty-five hours**.

Hands-on Activity

Read and write time in the 24-hour clock.

Work in pairs.

1. Read the departure time from the table.

Flight Number	Destination	Time of Departure from Singapore	Time of Arrival at Destination
SQ192	Penang	08 05	09 30
SQ112	Kuala Lumpur	15 10	16 05
MH630	Kota Kinabalu	17 05	19 30
MI368	Langkawi	18 35	20 00

2. Your partner identifies the destination from the table and reads the arrival time.
3. Switch roles. Repeat 1 and 2.
4. Discuss why the 24-hour clock is used instead of the 12-hour clock for flight schedules.

Guided Practice

1. Write the following times using the 24-hour clock.
   a. 8.30 p.m. _____
   b. 11.15 p.m. _____

2. Express the following times using the 24-hour clock.
   a. 8.50 a.m. _____
   b. 11.25 a.m. _____
   c. 8.50 p.m. _____
   d. 7.40 p.m. _____

3. Express the following times using the 12-hour clock.
   a. 07 35 _____
   b. 12 30 _____
   c. 18 40 _____
   d. 21 35 _____

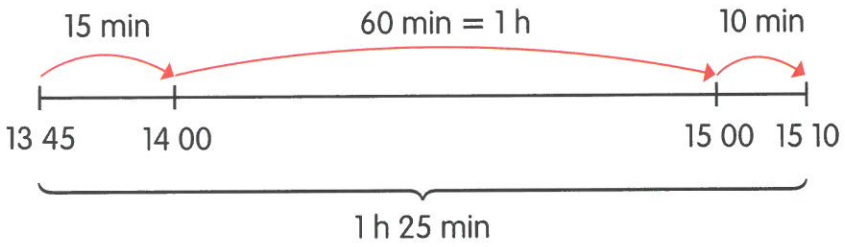
Solving word problems using a 24-hour clock

Before you learn ...

Casey took a train to Town X. The train ride started at 23 15 on Monday. He arrived in Town X at 05 45 on Tuesday. How long was the train ride?

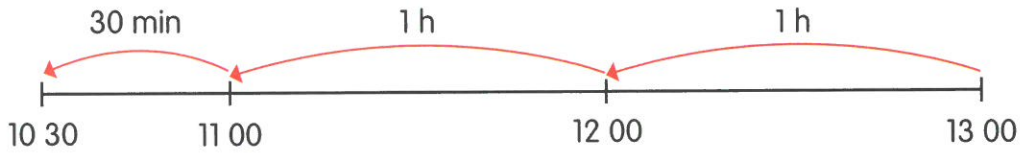
Learn

1 A plane left Changi Airport at 13 45 and landed in Kuching, Sarawak at 15 10 on the same day. How long was the journey?



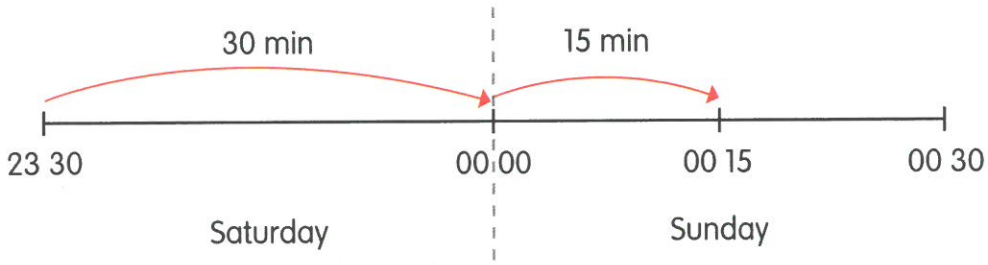
The journey was 1 h 25 min long.

2 Andy watched a movie that lasted 2 h 30 min. The movie ended at 13 00. What time did the movie start?



The movie started at 10 30.

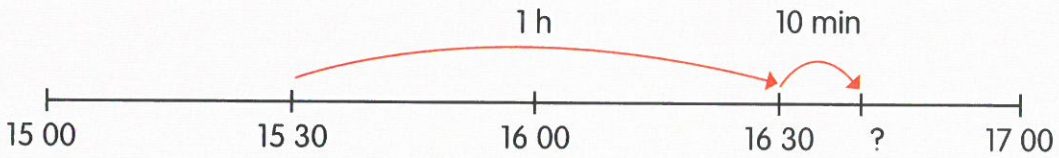
3 Mrs Ho went to a concert on Saturday. The concert ended at 23 30. She reached home 45 minutes later. When did she reach home?

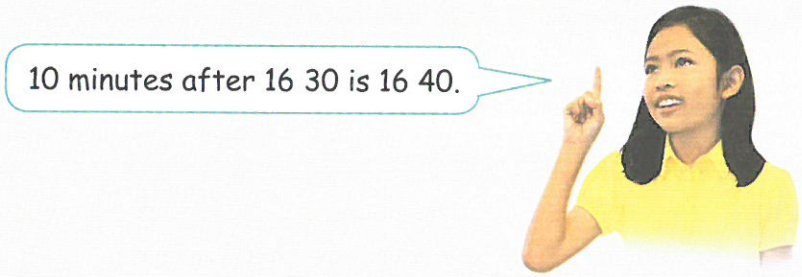


Mrs Ho reached home at 00 15 on Sunday.

4 David's art lesson started at 15 30. The lesson lasted 1 h 10 min. What time did the art lesson end?

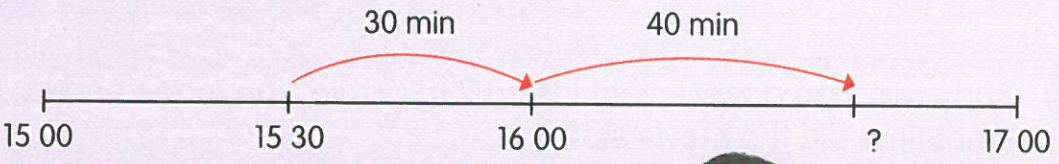
Method 1

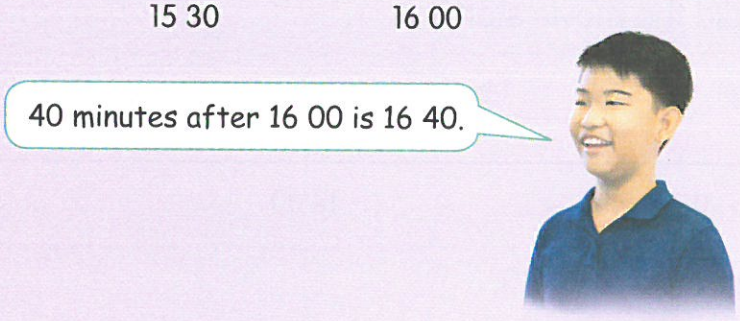




Method 2

1 h 10 min = 70 min = 30 min + 40 min





The art lesson ended at 16 40.

Hands-on Activity

Solve problems involving time in the 24-hour clock.

Work in groups.

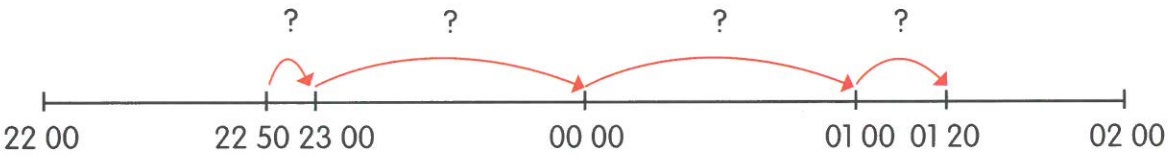
1. Use the following to create a word problem.

20 34	1 h 45 min	Eugene	homework
began	finished	what time	he took

2. Exchange word problems with other groups.
3. Solve the word problems using a time line.

Guided Practice

1. A plane departed Singapore at 22 50 on Wednesday. It landed in Bali at 01 20. How long was the flight? Did the plane reach Bali on the same day or the next day?

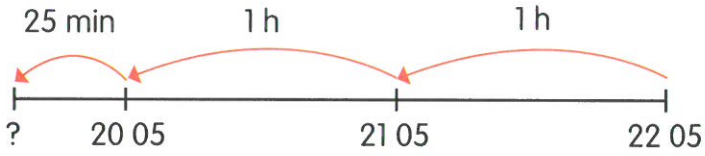


From	To	Time Taken
22 50	23 00	
23 00	00 00	
00 00	01 00	
01 00	01 20	

The flight was ____ h ____ min long.

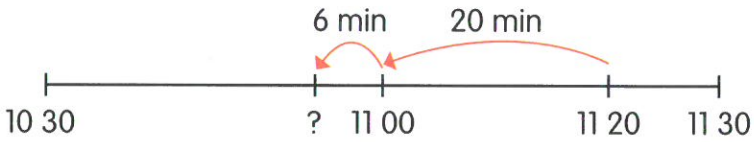
The plane reached Bali on the ____ day.

2 A movie ended at 22 05. It lasted 2 h 25 min. What time did the movie start?



The movie started at ____.

3 Shirley took the MRT at Sembawang Station and reached Newton Station 26 minutes later. She arrived at Newton Station at 11 20. What time did she board the train at Sembawang Station?



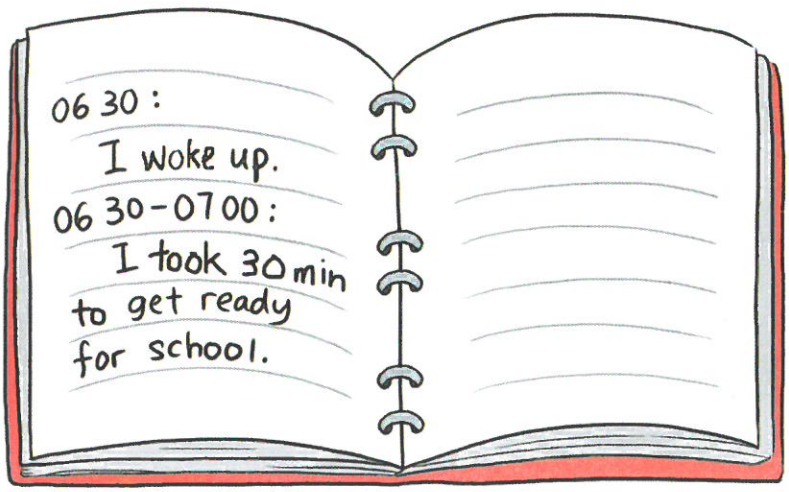
Shirley boarded the train at ____.

Maths Sharing

Describe everyday events using the 24-hour clock.

Using the 24-hour clock, make a diary of your activities on a school day from the time you wake up to the time you go to bed.

Example



Workbook B: Practice 1, pages 165–168

Chapter 15 Review

1. Express the following times using the 24-hour clock.

   a) 10.35 a.m. _____ b) 7.50 p.m. _____

2. Express the following times using the 12-hour clock.

   a) 04 30 _____ b) 23 05 _____

3. Candice slept at 22 55 on Saturday. She woke up at 08 30 on Sunday. How long did she sleep? _____

4. John's test started at 11 45 and ended at 13 35. How long was his test? _____

5. Marie started her piano lesson at 09 30. The lesson lasted 45 minutes. What time did the lesson end? _____

6. A tour bus left Kuala Lumpur for Singapore at 23 25 on Thursday. The entire journey took 4 h 35 min. What time and which day of the week did the tour bus arrive in Singapore? _____

7. A musical was 2 h 15 min long. It ended at 22 45. What time did the musical start? _____

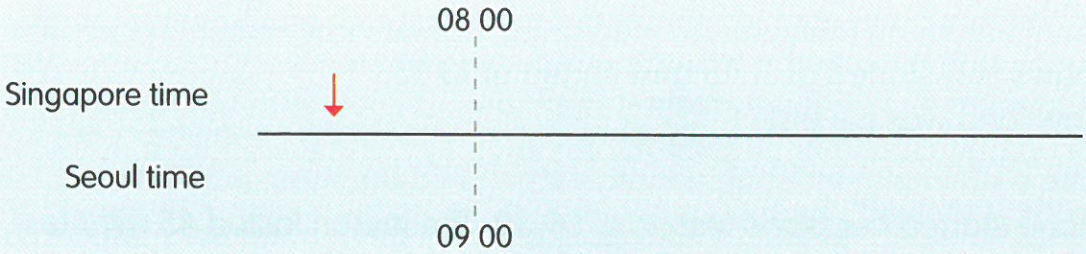
8. An awards show ended at 23 20. It was 3 h 55 min long. What time did the awards show start? _____

Workbook B:
Chapter 15 Review,
pages 169–172
Maths Journal, page 173

Put on Your Thinking Cap!

1. Remy started on his Science practice paper at 8 a.m. He took 2 minutes each for the 30 multiple-choice questions. He took 3 minutes each for the remaining 14 open-ended questions. What time did Remy complete the paper?

2. Diana took a flight from Singapore to Seoul. When it was 08 00 in Singapore, it was 09 00 in Seoul. The flight was 6 h 35 min long. When Diana landed in Seoul, the clock in the airport showed 14 20. What was the time in Singapore when Diana's flight departed? Express your answer using the 24-hour clock.



3. A clock was set correctly at midnight. It loses exactly 20 minutes every hour. It now shows 0400. What should be the correct time now?

Workbook B:
Put on Your Thinking Cap! page 174
Review 7, pages 175–180
Revision 2, pages 181–200

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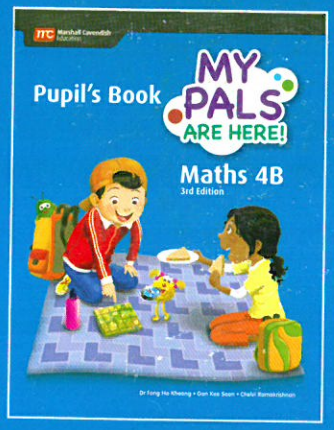

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