MATHEMATICS

Grade 5

English

Learner Activity Book

2022 TERM 1

Introduction

This Learner Activity Book has numbered daily activities for classwork and homework for all the lessons in Term 1. The activities correspond to the activities in the Lesson Plans.

Answers to the activities can be written in this book.

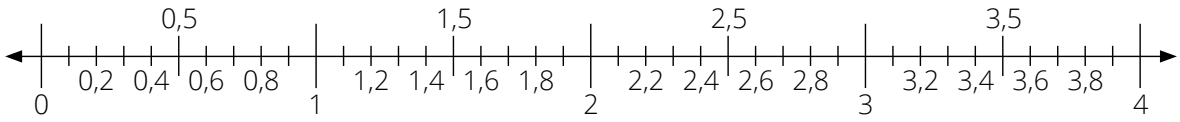
If learners work systematically through these mathematics activities, they will cover the whole curriculum. These activities are planned as a fun way to help learners to acquire the prescribed mathematics knowledge and skills.

Contents

Lesson 1: Tenths and hundredths

Mental maths

EXAMPLE: Count forwards in 0,1s between 1,1 and 1,7.
You can use the number line to help you.
Answer: 1,2; 1,3; 1,4; 1,5; 1,6



1 Count forwards in 0,1s

a Between 0,3 and 0,8 _____

b Between 2,8 and 3,4 _____

c From 1,6 to 2,1 _____

2 Count backwards in tenths

a From 2,9 to 2,2 _____

b Between 1,4 and 0,8 _____

c From 2,1 to 1,6 _____

3 Count forwards in 0,5s

a From 1 to 3 _____

b Between 0,5 and 4 _____

c From 1,6 to 2,1 _____

4 Count backwards in 0,5s

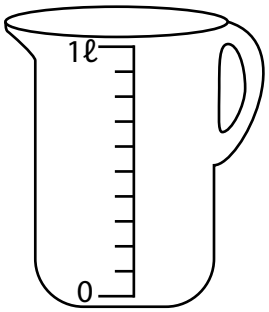
a From 3 to 0 _____

b Between 2,5 and 1 _____

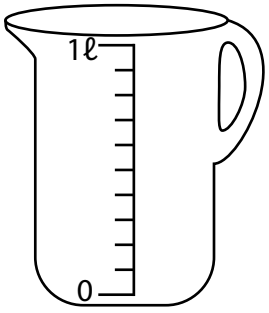
Activity 1

Work with a partner and the rest of your class.

1 Draw a line to show $\frac{7}{10}$ ℓ on the measuring jug.



2 Draw a line to show $\frac{4}{10}$ ℓ on the measuring jug.



3 Draw a line to show $1\frac{6}{10}$ ℓ on the measuring jug.

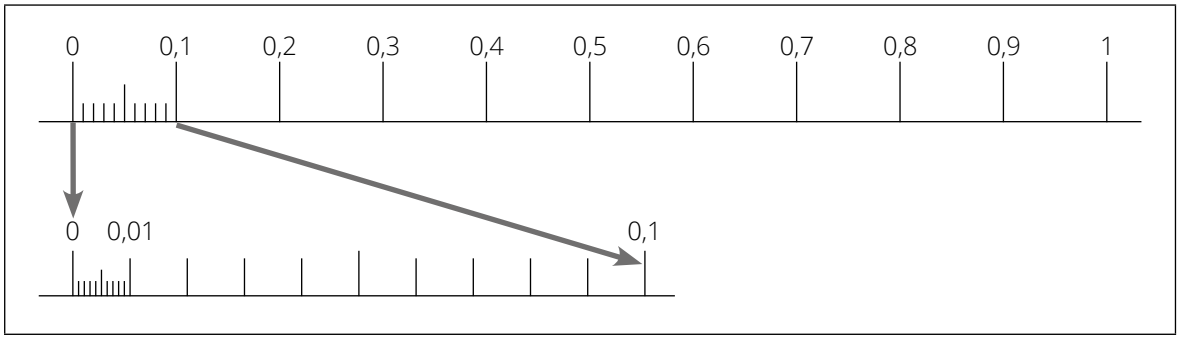
4 Write the three common fractions in the place value table.

	FRACTIONS	**PLACE VALUE TABLE**		
		O	**,**	**tenths**
a	$\frac{7}{10}$		,	
b	$\frac{4}{10}$		,	
c	$1\frac{6}{10}$		,	

Activity 2

Work with a partner

Study these number lines.



1 Look at the top number line. Use it to answer these questions:

a How many 0,1s make up 1?

_____

b How many 0,1s make up 0,5?

_____

c How many 0,1s make up 0,3?

_____

d How many 0,1s make up 0,9?

_____

2. Now answer these:

a How many 0,1s make up 2?

_____

b How many 0,1s make up 3?

_____

c How many 0,1s make up 5?

_____

d How many 0,1s make up 1,5?

_____

e How many 0,1s make up 3,8?

_____

_____

3 Look at both number lines. Use them to answer these questions:

a How many 0,01s make up 0,1?

_____

b How many 0,01s make up 0,5?

_____

c How many 0,01s make up 0,14?

_____

4 Now answer these:

a How many 0,01s make up 1?

_____

b How many 0,01s make up 1,96?

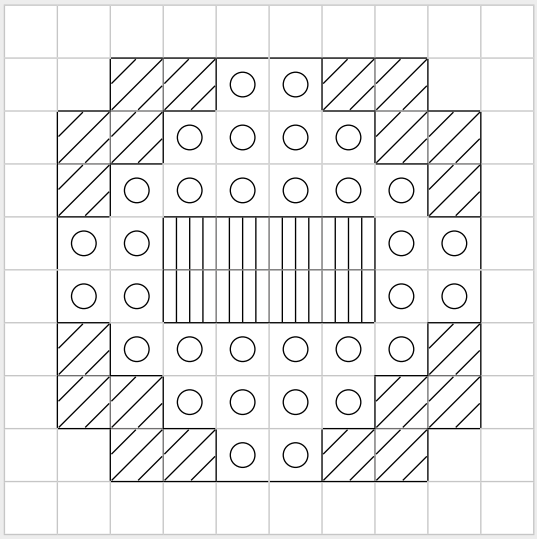
_____

c How many 0,01s make up 2?

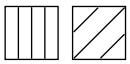
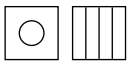
_____

HOMEWORK

Look at the Ndebele wall painting. It is drawn on a wall with 100 squares.



Complete the table. An example has been done for you.

	Pattern in square	No. of squares in this pattern	Written as a common fraction	Written as a decimal fraction	Written in words
Example		8	$\frac{8}{100}$	0,08	zero comma zero eight
1					
2					
3					
4					
5					

Lesson 2: Thousandths

Mental maths

EXAMPLE: Count forwards in 0,1s between 21,1 and 21,6.
Answer: 21,2; 21,3; 21,4; 21,5

1) Count forwards in 0,1s between 21,8 and 22,3 _____

2) Count backwards in 0,1s from 22,5 to 21,9 _____

3) Count forwards in 0,5s between 21,5 and 22,5 _____

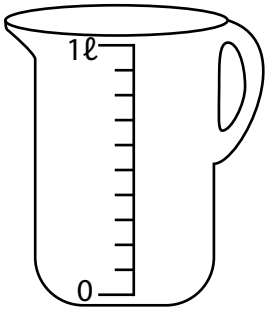
4) Count forwards in 0,01s from 21,81 to 21,86 _____

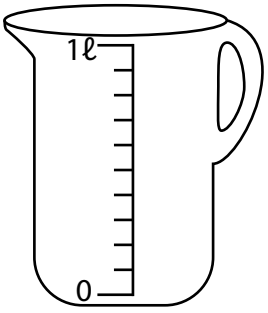
5) Count forwards in 0,05s between 21,50 and 21,75 _____

Link to previous lesson

Mother used a measuring jug to measure the amount of water in a kettle.
She found that there was 1,4 litres of water in the kettle.

Draw lines on the two measuring jugs to show 1,4 litres:



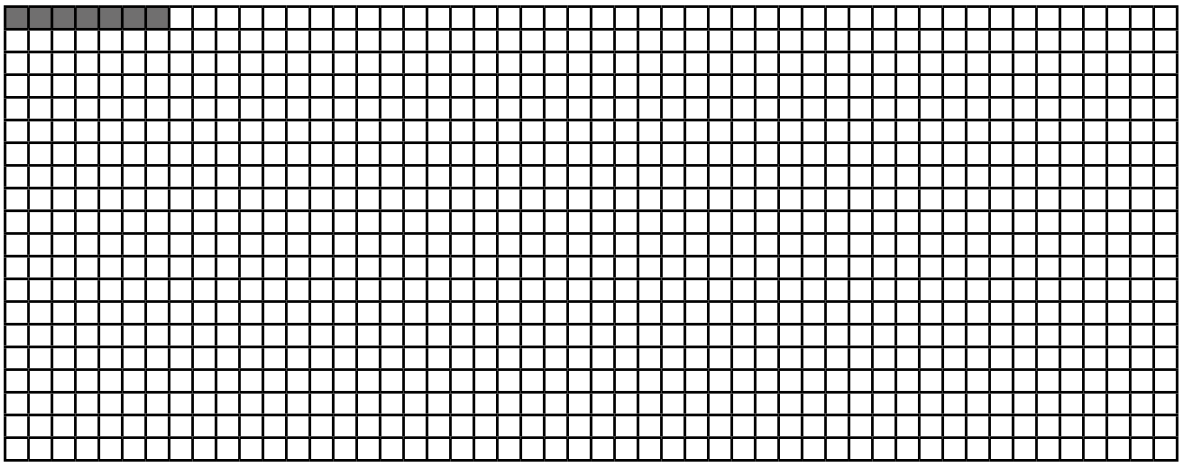


Activity 1

Work on **1**, **2** and **3** with your teacher and the whole class

Work on **4** and **5** with your partner

1 Look at this rectangle:



a How many small squares are there in the length or longer side of this rectangle?

_____

b How many small squares are there in the breadth or shorter side of this rectangle?

_____

c Into how many small squares has the whole rectangle been divided into?

_____

d How many thousandths make up 1 unit?

_____

2 Look at the rectangle again.

a How many small squares of the rectangle have been shaded? _____

b What fraction of the whole has been shaded?

_____

3 This is a place value table:

Thousands	Hundred	Tens	Ones		tenths	hundredths	thousandths
Th	**H**	**T**	**O**	**,**	**t**	**h**	**th**

a Write seven thousandths $\left(\frac{7}{1\,000}\right)$ in the place value table.

b What fraction of the whole has NOT been shaded?

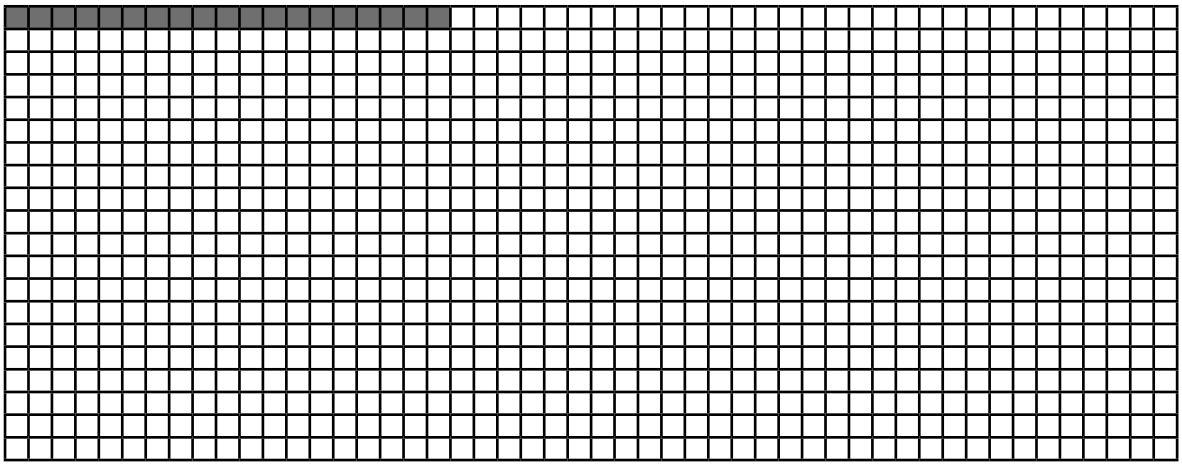
_____

c How do we say this in words?

_____

d Write this fraction on your place value table.

4 Look at this rectangle:



a How many small squares of the rectangle have been shaded?

_____

b What fraction of the whole has been shaded?

_____

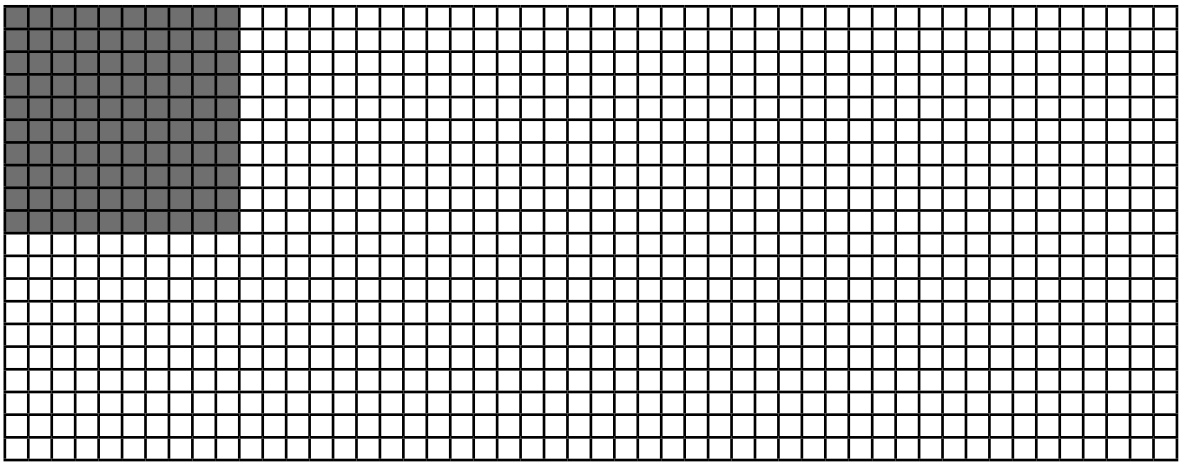
c What fraction of the whole has not been shaded?

_____

d Write these two fractions on this place value table.

Thousands	Hundred	Tens	Ones		tenths	hundredths	thousandths
Th	**H**	**T**	**O**	**,**	**t**	**h**	**th**

5 Look at this rectangle:



a How many small squares of the rectangle have been shaded?

_____

b What fraction of the whole has been shaded?

_____

c What fraction of the whole has not been shaded?

_____

d Write these two fractions on this place value table.

Thousands	Hundred	Tens	Ones		tenths	hundredths	thousandths
Th	**H**	**T**	**O**	**,**	**t**	**h**	**th**

Activity 2

Work on **1**, **2** and **3** with your teacher and the whole class

Work on **4**, **5** and **6** with your partner

This is ***Mafadi*** (which means Mother of Fadi in Sotho). It is the highest mountain in South Africa.

It is on the border of South Africa and Lesotho, and it is 3 451 metres above sea level.

1 Think about how you can write 3 451 metres in kilometres.
Write your answer here.

_____

_____

_____

2 Make a clue card for writing metres in kilometres.

Writing metres in kilometres	
Metres	**Kilometres (as a fraction and then as a decimal)**
1 000 m	_____ km = _____ km
100 m	_____ km = _____ km
10 m	_____ km = _____ km
10 m	_____ km = _____ km

3 Use the place value table to write 3 451 m in km.

3 451 m = 3 000 m + 400 m + 50 m + 1 m.

3 000 m = 3 × 1 000 m = 3 × 1 km

400 m = 4 × 100 m = 4 × 0,1 km = _____ km

50 m = 5 × 10 m = 5 × 0,01 km = _____ km

1 m = _____ km

		Ones		**tenths**	**hundredths**	**thousandths**	
		O	**,**	**t**	**h**	**th**	
3 000 m	=						km
400 m	=						km
50 m	=						km
1 m	=						km
3 451 m	=						km

Answer: 3 451 m = _____ km

4 A long-distance swimmer swam a distance of 8 259 m.

Write 8 259 m in kilometres _____.

5 The mass of a baby is shown on the mass meter.

Write the mass in kilograms _____.

6 Do the following conversions:

a _____ g = 1,039 kg

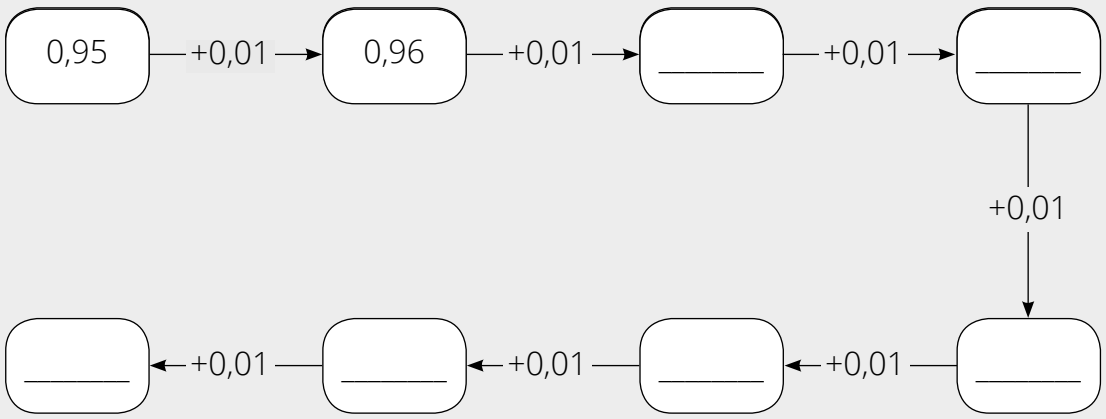
b 250 mℓ = _____ ℓ

c _____ mℓ = 4,075 ℓ

d 800 m = _____ km

HOMEWORK

Write an answer in each box:



Lesson 3: Comparing decimal fractions

Mental maths

1) Count forwards in 0,001s

a) From 1,002 to 1,006 _____

b) Between 1,202 and 1,206 _____

c) Between 1,008 and 1,012 _____

2) Count backwards in 0,001s

a) From 1,498 to 1,494 _____

b) Between 1,307 and 1,303 _____

c) From 1,293 to 1,289 _____

Link to previous lesson

1 a How many 0,1s are there in 1? _____

b Explain how you got your answer.

_____

_____

2 a How many 0,01s are there in 0,1? _____

b Explain how you got your answer.

_____

_____

Activity 1

Work with a partner.

1 Look at the diagrams and then answer the questions.

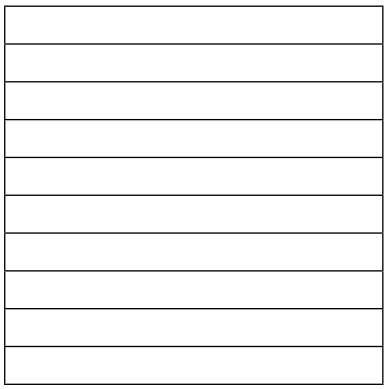


Diagram A

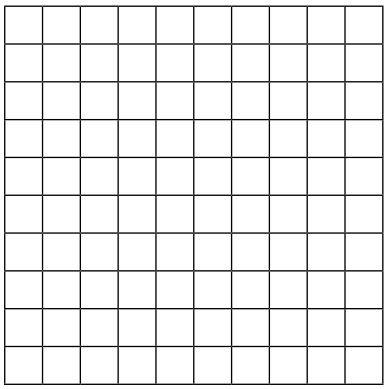


Diagram B

a How many equal parts has Diagram A been divided into? _____

b How many equal parts has Diagram B been divided into? _____

2 **a** Shade $\frac{1}{10}$ of Diagram A.

b Shade $\frac{10}{100}$ of Diagram B.

3 **a** Write the part of the whole that has been shaded in Diagram A as a decimal fraction. _____

b Write the part of the whole that has been shaded in Diagram B as a decimal fraction. _____

4 Compare the amount of shading in Diagram A and Diagram B. What do you notice?

_____

5 Complete the number sentence to make it true. Use <, > or =.

0,1 _____ 0,10.

6 Is 0,1 = 0,10 = 0,100? Why?

_____

_____

7 Shade the diagrams to show that 0,5 and 0,50 are equal.

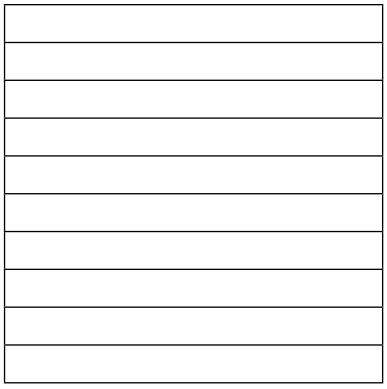


Diagram A

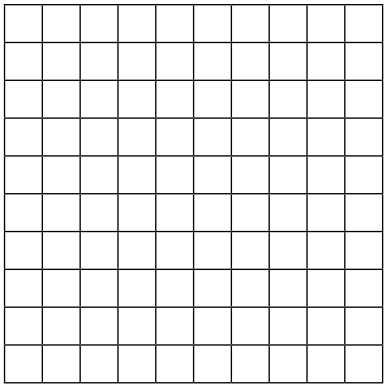
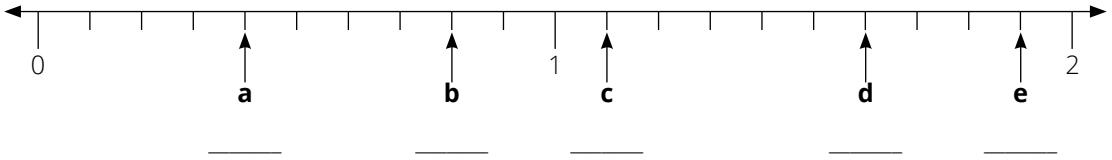


Diagram B

Activity 1

Work with a partner.

1 Use the number line to answer the questions.



_____ _____ _____ _____ _____

What decimal fraction does each mark on the number line show? _____

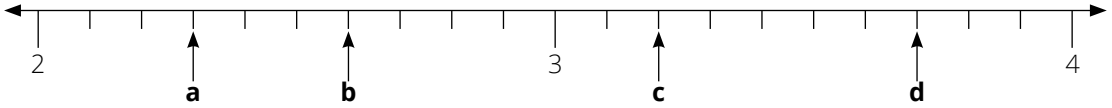
Write the decimal fraction shown by the arrows on each number line.

a _____ **d** _____

b _____ **e** _____

c _____

2 Use the number line to answer the questions.



What decimal fraction does each mark on the number line show? _____

Write the decimal fraction shown by the arrows on each number line.

a _____ **d** _____

b _____ **e** _____

c _____

Activity 3

Work on **1**, **2** and **3** with your teacher and the whole class

Work on **4** with your partner.

1 Study the table and then answer the questions.

Results of the Boys Under 19 100 m sprint		
	Name	**Time in seconds**
A	Keletso Letele	11,4
B	Karabo Malatje	11,59
C	Puleng Manganya	11,53
D	Blessing Mmola	11,23
E	Thato Tau	12,01
F	Khutlo Tshose	11,9

a Will the winner be the person with the lowest time or the highest time?

_____

_____

b How do we know who the winner is? _____

_____

2 Write the times of each of the boys in the place value table. The first one has been done for you.

	Tens	**Ones**		**tenths**	**hundredths**	
Name	**T**	**O**	**,**	**t**	**h**	
A: 11,4	1	1	,	4		seconds
B: 11,59			,			seconds
C: 11,53			,			seconds
D: 11,23			,			seconds
E: 12,01			,			seconds
F: 11,9						seconds

3. Use the place value table to arrange the names in order, starting with the winner.

	Boy	**Time**
1st		seconds
2nd		seconds
3rd		seconds
4th		seconds
5th		seconds
6th		seconds

4 Now use the place value table to write each of the times in expanded notation.

Example:
15,68 = 10 + 5 + 0,6 + 0,08
= 10 + (5 × 1) + (6 × 0,1) + (8 × 0,01)

a A: 11,4 = 10 + _____ + _____

= 10 + (1) + ((4) × 0,1)

b B: 11,59 = 10 + 1 + _____

= 10 + 1 + _____ + _____

c C: 11,53 = _____

= _____

d D: 11,23 = _____

= _____

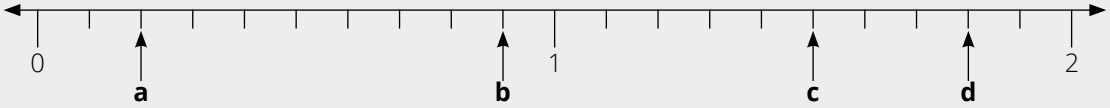
e E: 12,01 = _____

= _____

f F: 11,9 = _____

= _____

HOMEWORK



1 What decimal fraction does each small line on the number line represent?

_____

2 Write the decimal fraction shown by the arrows on the number line.

a _____

b _____

c _____

d _____

Lesson 4: Multiplying and dividing decimal fractions by 10, 100 and 1 000

Mental maths

Fill in the missing numbers

1 Count forwards in 0,001

a 0,500; 0,501; 0,502; _____; _____; _____

b 0,721; 0,722; 0,723; _____; _____; _____

c 0,675; 0,676; 0,677; _____; _____; _____

2 Count backwards in 0,001s

a 0,921; 0,92; 0,919; _____; _____; _____

b 0,505; 0,504; 0,503; _____; _____; _____

c 0,759; 0,758; 0,757; _____; _____; _____

Link to previous lesson

1 Compare the numbers 37,421 and 37,42.

a Write each number in the correct place value columns:

H	O	,	t	h	th

b Which number is bigger? _____

c Give a reason for your answer.

_____

_____

2. Expand the number 37,421.

37,421 = _____ × 10 + _____ × 1 + _____ × 0,1 + _____ × 0,01 + _____ × 0,001

Activity 1

Work on the questions with your teacher and the whole class.

1 Study the poster.

a How many 0,1s are there in 1? _____

b How many 0,01s are there in 0,1? _____

c How many 0,001s are there in 0,01? _____

2 Complete the sentences.

a 10 × 0,1 = _____ **b** 10 × 0,01 = _____ **c** 10 × 0,001 = _____

3 Complete the place value tables:

a

	H	T	O	,	t	h	th
10 ×			0	,	1		
=				,			

b

	H	T	O	,	t	h	th
10 ×			0	,	0	1	
=				,			

c

	H	T	O	,	t	h	th
10 ×			0	,	0	0	1
=				,			

4 Study the poster again.

a How many 0,01s are there in 1? _____

b How many 0,001s are there in 0,1? _____

5 Complete the following place value tables:

a

	H	T	O	,	t	h	th
100 ×			0	,	0	1	
=				,			

b

	H	T	O	,	t	h	th
100 ×			0	,	0	0	1
=				,			

6 Complete the following:

a When we multiply a number by 10, the digits move _____ places to the left.

b When we multiply a number by 100, the digits move _____ places to the left.

7 Use the place value tables to work out the answers.

a 10 × 0,3 = _____

	H	T	O	,	t	h	th
10 ×			0	,	3		
=				,			

b 10 × 4,5 = _____

	H	T	O	,	t	h	th
10 ×			4	,	5		
=				,			

c 100 × 0,86 = _____

	H	T	O	,	t	h	th
100 ×			0	,	8	6	
=				,			

d 100 × 6,027 = _____

	H	T	O	,	t	h	th
100 ×			6	,	0	2	7
=				,			

Activity 2

Work on the questions with your teacher and the whole class.

1 Fill in the answers: **a** 400 ÷ 10 = _____ **b** 40 ÷ 10 = _____

2 Complete the place value tables:

a

	H	T	O	,	t	h	th
	4	0	0	,			
÷ 10 =				,			

b

	H	T	O	,	t	h	th
		4	0	,			
÷ 10 =				,			

3 Complete the following:

When we divide a number by 10, the digits move _____ place to the left.

4 Now complete these place value tables:

a

	H	T	O	,	t	h	th
			4	,			
÷ 10 =				,			

b

	H	T	O	,	t	h	th
			0	,	4		
÷ 10 =				,			

c

	H	T	O	,	t	h	th
			0	,	0	4	
÷ 10 =				,			

5 Fill in the answers:

a 400 ÷ 100 = _____

b 4 000 ÷ 100 = _____

6 Complete the place value tables:

a

	Th	**H**	**T**	**O**	**,**	**t**	**h**	**th**
		4	0	0	,			
÷ 100 =					,			

b

	Th	**H**	**T**	**O**	**,**	**t**	**h**	**th**
	4	0	0	0	,			
÷ 100 =					,			

7 Complete the following:

When we divide a number by 100, the digits move _____ place to the left.

8 Complete the place value tables:

a

	H	**T**	**O**	**,**	**t**	**h**	**th**
			4	,			
÷ 100 =				,			

b

	H	**T**	**O**	**,**	**t**	**h**	**th**
			0	,	4		
÷ 100 =				,			

9 Use the place value tables to work out the answers.

a 31,9 ÷ 10 = _____

	H	T	O	,	t	h	th
		3	1	,	9		
÷ 10 =				,			

b 0,5 ÷ 100 = _____

	H	T	O	,	t	h	th
			0	,	4		
÷ 100 =				,			

c 80,6 ÷ 100 = _____

	H	T	O	,	t	h	th
		8	0	,	6		
÷ 100 =				,			

d 0,04 ÷ 10 = _____

	H	T	O	,	t	h	th
			0	,	0	4	
÷ 10 =				,			

HOMEWORK

Answer these questions:

1 5,3 × 10 = _____

2 5,3 ÷ 10 = _____

3 0,92 × 10 = _____

4 0,92 ÷ 10 = _____

5 4,6 × 100 = _____

6 4,6 ÷ 100 = _____

Lesson 5: Multiplying and dividing decimal fractions by 10, 100, and 1 000 (2)

Mental maths

	First number	Count forwards in 0,001s	Last number
Example	0,1		0,104
1	5,987		5,991
2	3,219		3,223
3	0,001		0,005
		Count forwards in 0,001s	
4	1, 009		1,005
5	2,093		2,089
6	6,003		5,999

Link to previous lesson

1 **a** 10 × 0,25 = _____

b 100 × 0,25 = _____

2 **a** 2,5 ÷ 10 = _____

b 2,5 ÷ 100 = _____

Activity 1

Work on the questions with your partner.

1 Fill in the answers:

a 1 000 × 4 = _____

b 1 000 × 40 = _____

2 Use the place value tables to check that your answers in question 1 are correct.

a 1 000 × 4

So, 1 000 × 4 = _____

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					4	,			
						,			

b 1 000 × 40

So, 1 000 × 40 = _____

	TTh	Th	H	T	O	,	t	h	th
1 000 ×				4	0	,			
						,			

3 Use your answers to questions 1 and 2 to complete the following:

When we multiply a whole number by 1 000, the digits move _____ places to the _____.

4 Now use these place value tables to investigate the multiplication of decimal fractions by 1 000:

a 1 000 × 0,4

So, 1 000 × 0,4 = _____

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					0	,	4		
						,			

b 1 000 × 0,04

So, 1 000 × 0,04 = _____

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					0	,	0	4	
						,			

c 1 000 × 0,004

So, 1 000 × 0,004 = _____

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					0	,	0	0	4
						,			

5 Use your answers to question 4 to complete the following:

When we multiply a decimal fraction by 1 000, the digits move _____ places to the _____.

6 Use what you have found in questions 1 to 5 to find answers to the following:

a 1 000 × 0,3

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					0	,	3		
			(3)	(0)	(0)	,			

So, 1 000 × 0,3 = _____

b 1 000 × 4,5

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					4	,	5		
		(4)	(5	(0)	(0)	,			

So, 1 000 × 4,5 = _____

c 1 000 × 0,89

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					0	,	8	9	
			(8)	(9)	(0)	,			

So, 1 000 × 0,89 = _____

d 1 000 × 6,027

	TTh	Th	H	T	O	,	t	h	th
1 000 ×					6	,	0	2	7
		(6)	(0)	(2)	(7)	,			

So, 1 000 × 6,027 = _____

Activity 2

Work on the questions with your partner.

1 Fill in the answers:

a 4 000 ÷ 1 000 = _____

b 40 000 ÷ 1 000 = _____

2 Use the place value table to check that your answers in question 1 are correct.

a 4 000 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th
		4	0	0	0	,			
÷ 1 000 =						,			

So, 4 000 ÷ 1 000 = _____

b 40 000 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th
	4	0	0	0	0	,			
÷ 1 000 =						,			

So, 40 000 ÷ 1 000 = _____

3 Use your answers to questions 1 and 2 to complete the following:

When we divide a whole number by 1 000, the digits move _____ places to the _____.

4 Now use these place value tables to investigate the division of more whole numbers by 1 000:

a 400 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th
			4	0	0	,			
÷ 1 000 =						,			

So, 400 ÷ 1 000 = _____

b 40 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th
				4	0	,			
÷ 1 000 =						,			

So, 40 ÷ 1 000 = _____

c 4 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th
					4	,			
÷ 1 000 =						,			

So, 4 ÷ 1 000 = _____

5 Use your answers to question 4 to complete the following:

When we divide a number by 1 000, the digits move _____ places to the _____.

6 Use what you have found in questions 1 to 5 to find answers to the following:

a 9 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th
					9	,			
÷ 1 000 =						,			

So, 9 ÷ 1 000 = _____

b 31 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th
				3	1	,			
÷ 1 000 =						,			

So, 31 ÷ 1 000 = _____

c Challenge: 41 235

	TTh	Th	H	T	O	,	t	h	th
	4	1	2	3	5	,			
÷ 1 000 =						,			

So, 41 235 ÷ 1 000 = _____

d Challenge: 0,5 ÷ 1 000

	TTh	Th	H	T	O	,	t	h	th	
					0	,	5			
÷ 1 000 =						,				

So, 0,5 ÷ 1 000 = _____

Activity 3

Work on your own

1 The distance run in a standard marathon is 49,195 km.
Sam has run 10 standard marathons in the last five years.

a How many kilometres has Sam run altogether in the 10 marathons?

_____

_____

b How many metres has Sam run?

_____

2 An Aid organisation has 1 520 kg of mealie meal to distribute.

a How much would each family receive if they distributed the mealie meal to 100 families?

_____

_____

b How much would each family receive if they distributed the mealie meal to 1 000 families?

_____

_____

c Write each of the two answers in grams.

_____

_____

HOMEWORK

Complete:

1 1 065 ÷ 1 000 = _____

2 13,471 × 1 000 = _____

3 341 ÷ 1 000 = _____

4 84,231 × 1 000 = _____

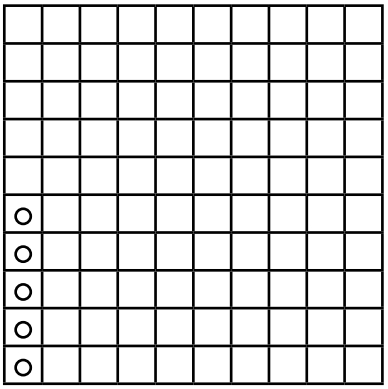
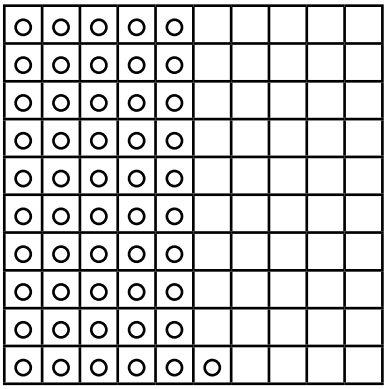
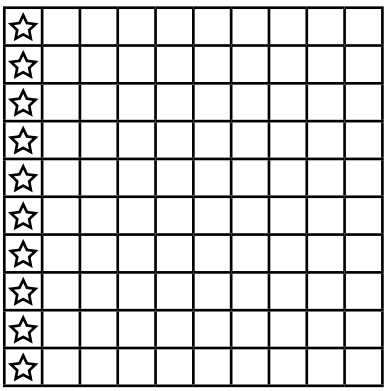
5 90 040 ÷ 1 000 = _____

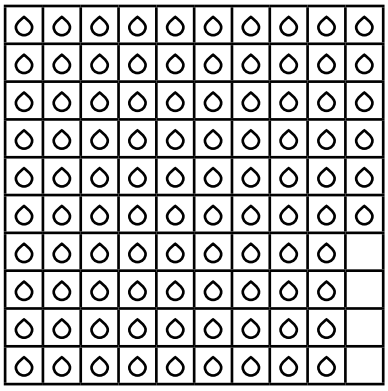
6 12,005 × 1 000 = _____

Lesson 6: Consolidation

Work on your own

1 Study the diagrams and then complete the table. An example has been done for you.

		Marked blocks as a common fraction	Marked blocks as a decimal fraction
Example:		$\frac{5}{100}$	0,05
a			
b			

c			

2 Show these numbers on the number line below.

a 6,07 **b** 6,72 **c** 7,05 **d** 7,16

3 In each case, use the place value tables to help you say which decimal fraction is bigger and why.

a 0,9 or 0,09

H	T	O	,	t	h	th
			,			
			,			

_____ is bigger than _____ because _____

_____

b 3,579 or 3,6

H	T	O	,	t	h	th
			,			
			,			

_____ is bigger than _____ because _____

_____

c 0,23 or 0,3

H	T	O	,	t	h	th
			,			
			,			

_____ is bigger than _____ because _____

_____

d 0,5 or 0,50

H	T	O	,	t	h	th
			,			
			,			

_____ is bigger than _____ because _____

_____

4 Complete the number sentences:

a 39,2 × 100 = _____

b 39,2 × 1 000 = _____

c 39,2 ÷ 10 = _____

d 39,2 ÷ 100 = _____

5 Complete:

a 2 046 ÷ 1 000 = _____

b 49,321 × 1 000 = _____

c 649 ÷ 1 000 = _____

d 4,001 × 1 000 = _____

e 10 004 ÷ 1 000 = _____

f 2,3 × 1 000 = _____

Lesson 7: Very big numbers

Mental maths

	First number	Multiples of 10 between the first number and the last number	Last number
Example	340	350; 360; 370; 380; 390	400
1	670		710
2	780		820
3	390		450
4	960		1 000
Draw a circle around the numbers that are multiples of 10			
5	42; 60; 139; 670; 200		
6	167; 670; 380; 0; 220; 547		
7	231; 20; 250; 298; 700; 7		

Activity 1

Work on the questions with your partner and with the whole class.

1 Write the number 5 933 000 on the place value table.

BILLIONS			MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O	H	T	O
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

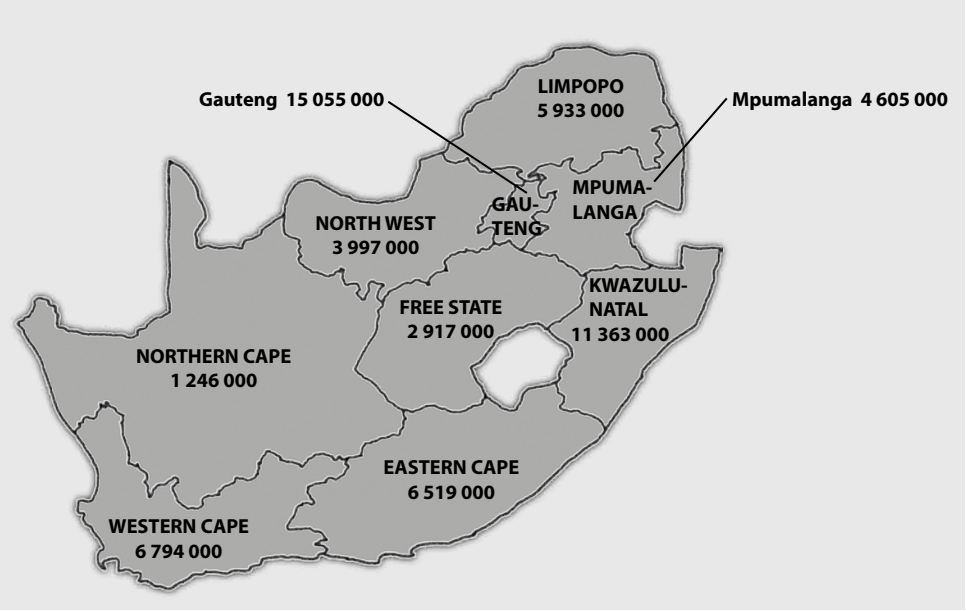
2 Look at 5 933 000 in the place value table:

a How many millions are there? _____

b How many thousands are there? _____

c How many ones are there? _____

3 Write the population of each province in the place value table:



	BILLIONS			MILLIONS			THOUSANDS			ONES		
	H	T	0	H	T	O	H	T	O	H	T	O
PROVINCE	HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
Eastern Cape												
Free State												
Gauteng												
KwaZulu-Natal												
Limpopo												
Mpumalanga												
Northern Cape												
Western Cape												

4 Take turns with your partner to practice saying the population of each province out loud.

5 The total world population in June 2020 was 7 794 798 739.

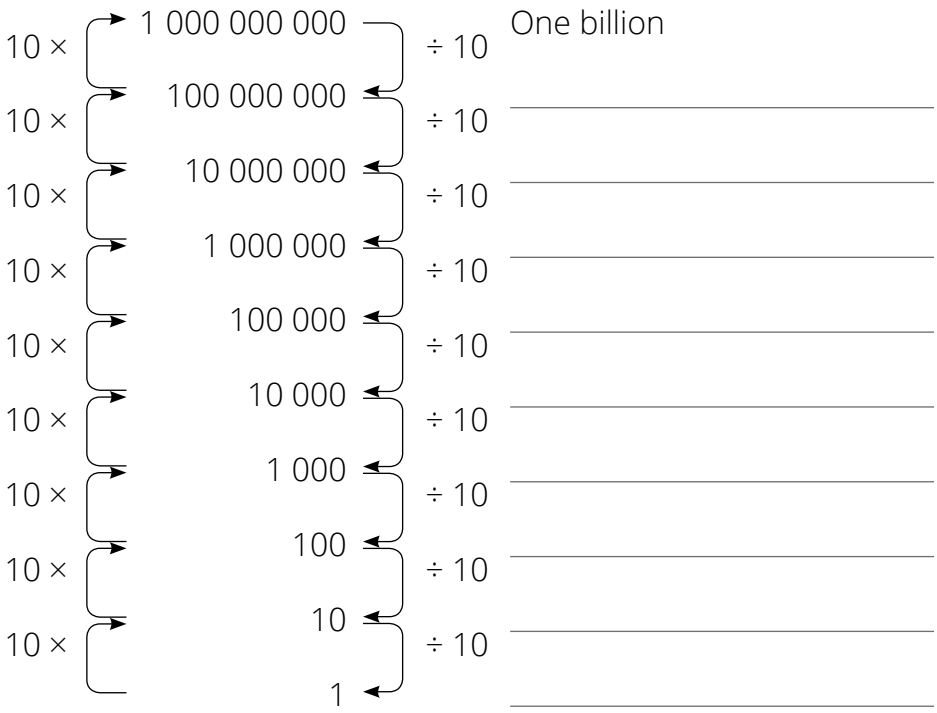
a Write this number in the place value table.

BILLIONS			MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O	H	T	O
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

b Read the number to your partner.

6 This diagram shows the place values from 1 000 000 000 to 1.

a Fill in the missing names on this diagram.



b What do we do to move from a place value to the next **larger** place value?

_____

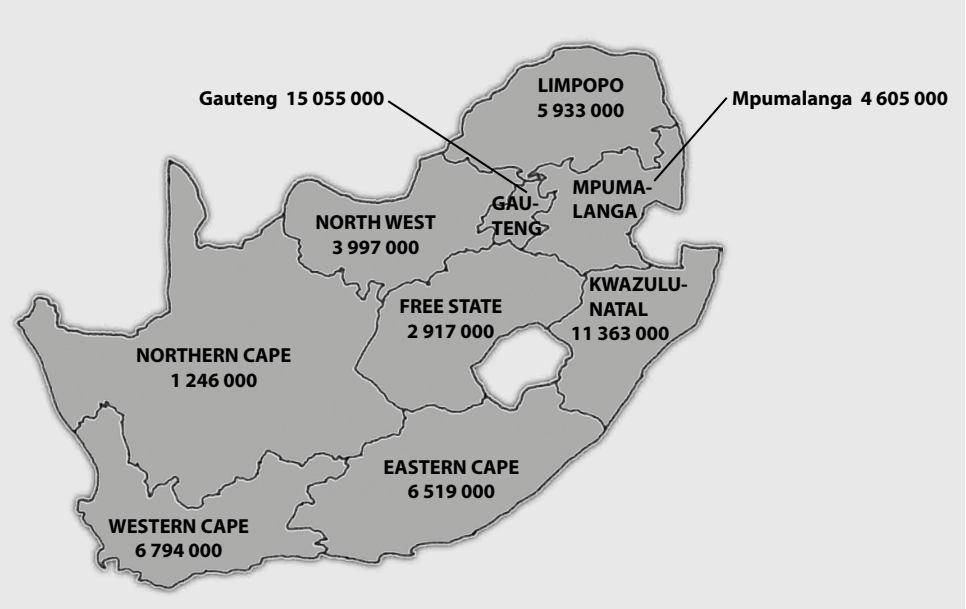
c What do we do to move from a place value to the next **smaller** place value?

_____

Activity 2

Work on the questions with your teacher and the whole class.

1 Look at the map of South Africa and at the number of people in each province in 2019.



What do you notice about the digits in the Hundred's place, in the Ten's place and in the One's place?

_____

_____

2 Remember that the total world population in June 2020 was 7 794 798 739. This number is written in the place value table.

BILLIONS			MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O	H	T	O
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
		7	7	9	4	7	9	8	7	3	9

a Round this off to the nearest multiple of a thousand.

_____

b When you rounded the number off, which digit in which place did you focus on?

_____

_____

3 **a** Round the population of the Northern Cape and the Eastern Cape to the nearest multiple of a million.

	MILLIONS			THOUSANDS			ONES		
	H	T	O	H	T	O	H	T	O
	HM	TM	M	HTh	TTh	Th	H	T	O
Eastern Cape			6	5	1	0	0	0	0
Northern Cape			1	2	4	6	0	0	0

Eastern Cape _____

Northern Cape _____

b What digit in which place did you focus on?

_____

_____

c How many times more is the population of the Eastern Cape than the Northern Cape?

_____

_____

4 a Round the population of the Northern Cape and the Eastern Cape to the nearest multiple of a million.

	MILLIONS			THOUSANDS			ONES		
	H	T	O	H	T	O	H	T	O
	HM	TM	M	HTh	TTh	Th	H	T	O
Free State			2	9	1	7	0	0	0
Limpopo			5	9	3	3	0	0	0

Free State _____

Limpopo _____

b. How many times more is the population of Limpopo than the Free State?

_____

_____

HOMEWORK

1 The population of India in June 2021 was 1 393 409 038.

a Write the number in the place value table.

	BILLIONS			MILLIONS			THOUSANDS			ONES		
	H	T	0	H	T	O	H	T	O	H	T	O
COUNTRY	HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
India												
China												

b Write the population of India in words.

_____

_____

2 The population of China in June 2021 was 1 444 494 142.

a Write the number in the place value table.

b Write the population of China in words.

_____

_____

3 Which country has the higher population? Give a reason for your answer.

_____

_____

_____

_____

_____

Lesson 8: Composition of numbers

Mental maths

	List the multiples of 100 between	Answer
Example	1 245 and 1 660	1 300; 1 400; 1 500; 1 600
1	69 and 590	
2	4 400 and 4 800	
3	99 660 and 1 000 078	
4	181 960 and 182 301	
	List the multiples of 1 000 between	**Answer**
5	137 000 and 138 101	
6	18 090 and 22 056	

Link to previous lesson

1 The population of Russia in June 2021 was 145 992 723.

a Write this number in the place value table:

BILLIONS			MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O	H	T	O
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

b Write this number in words.

_____

_____

_____

2 Round the number to the nearest multiple of a thousand.

_____

3 Round the number to the nearest multiple of a million.

_____

Activity 1

Work with a partner

1 a Write the number 8 432 678 551 in the place value table.

BILLIONS			MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O	H	T	O
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

b Write the number 8 432 678 551 in words.

_____

_____

_____

c Use your place value cards to show the number 8 432 678 551.

d What is the value of the 7 in the number 8 432 678 551?

_____

e What is the value of the 4 in the number 8 432 678 551?

_____

2 What numbers are shown at A, B, C and D on the number line:

A _____

B _____

C _____

D _____

3 Write numbers B to D in expanded notation:

B _____

C _____

D _____

Activity 2

Work on your own.

1 We want to find out how many millions there are in 58 billion or 58 000 000 000.

a To help you work out the answer, write the number 58 000 000 000 in the place value table:

BILLIONS			MILLIONS			THOUSANDS			ONES		
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

b How many millions are there in 58 billion?

_____

2 Use the place value tables to answer the following.

a How many thousands in 6 million? Write the answer in digits and in words.

_____

_____

BILLIONS			MILLIONS			THOUSANDS			ONES		
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

b How many ten millions in 13 billion? Write the answer in digits and in words.

_____

_____

BILLIONS			MILLIONS			THOUSANDS			ONES		
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

c Write down a number that has 52 ten millions. Write the answer in digits and in words.

_____

_____

BILLIONS			MILLIONS			THOUSANDS			ONES		
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

d Write down the number that has 40 hundred millions and 79 hundreds in digits and in words.

_____

_____

BILLIONS			MILLIONS			THOUSANDS			ONES		
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

3 We often see numbers like 7,1 M (seven comma one million)

a Write the number in the place value table.

BILLIONS			MILLIONS			THOUSANDS			ONES		
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O
					7,	1					

b Use the place value table to write 7,1 M in full without the comma.

_____

4 Use the place value table to write each of these numbers in full without the comma.

a 9,5 M _____

b 10,2 M _____

c 210,8 M _____

	MILLIONS			THOUSANDS			ONES		
	HM	TM	M	HTh	TTh	Th	H	T	O
a 9,5 M									
b 10,2 M									
c 210,8 M									

5 You have learned that a digit:

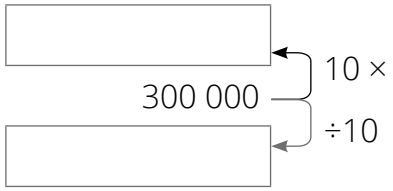
- will move one column to the left when we multiply by 10
- will move one column to the right when we divide by 10

Th	**H**	**T**	**O**	
5	0	0	0	
	5	0	0	10 ×
		5	0	÷10

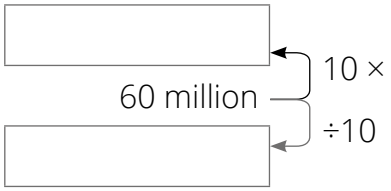
Fill in the blocks to show:

- the number that is 10 times bigger than the given number.
- the number that is 10 times smaller than the given number.

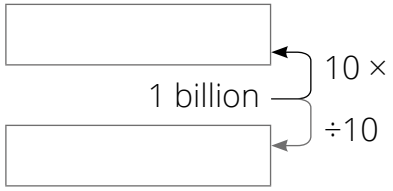
a



b



c



HOMEWORK

BILLIONS			MILLIONS			THOUSANDS			ONES		
H	T	O	H	T	O	H	T	O	H	T	O
HB	TB	B	HM	TM	M	HTh	TTh	Th	H	T	O

Complete the following:

1 10 × 900 000 = _____

2 10 × 4 million = _____

3 10 × 10 000 = _____

4 900 000 ÷ 10 = _____

5 4 million ÷ 10 = _____

6 10 000 ÷ 10 = _____

Lesson 9: Adding big numbers

Mental maths

	What is ...	Answer		What is ...	Answer
1	4 + 9		**6**	8 + 9	
2	5 + 5		**7**	7 + 8	
3	9 + 2		**8**	9 + 7	
4	8 + 8		**9**	8 + 5	
5	7 + 7		**10**	6 + 8	

Link to previous lesson

1 Write two different 11-digit numbers in the blocks.

1st number

2nd number

2 Compare the numbers by saying which number is bigger.

_____

_____

3 Give a reason for the answer you gave in question 2.

_____

_____

_____

Activity 1

Work with your whole class.

1 In 2019, Gauteng and KwaZulu-Natal were the two provinces with the largest population in South Africa.

- The population of Gauteng was approximately 155 055 000.
- The population of KwaZulu-Natal was approximately 11 363 000.

What is the combined population of Gauteng and KwaZulu-Natal?

a Draw a diagram here to show what you need to do with the numbers.

b Write a number sentence to show the calculation.

_____

2 Use the column method to find the answer to the number sentence.

a Fill the numbers into the place value column. Don't forget to write the operation you are using on the left-hand side of the calculation.

b Do the calculation.

	TM	M	HTh	TTh	Th	H	T	O

c Complete the following:

15 055 000 + 11 363 000 = _____

The combined population of Gauteng and KwaZulu-Natal is _____

Activity 2

Work with a partner.

1 Calculate: 4 629 521+ 3 673 338

	M	HTh	TTh	Th	H	T	O

4 629 521 + 3 673 338 = _____

2 An Aid Organisation collects money for charity. Last year it collected R6 415 832, and this year it collected R592 308. How much money did it collect altogether?

a Write the number sentence here.: _____

b Do the calculation here:

	M	HTh	TTh	Th	H	T	O

c Write the answer as a sentence:

The Aid Organisation collected _____

Activity 3

Work on your own.

1 Calculate: 9 214 395 + 4 928 417 = ☐

	TM	M	HTh	TTh	Th	H	T	O

2 Solve: 16 703 345 + 88 219 = ☐

	TM	M	HTh	TTh	Th	H	T	O

HOMEWORK

1 Calculate: 4 365 204 + 9 632 839 = ☐

	TM	M	HTh	TTh	Th	H	T	O

2 Calculate: 1 794 368 + 3 253 452 = ☐

	TM	M	HTh	TTh	Th	H	T	O

Lesson 10: Subtracting big numbers

Mental maths

	What is …	Answer		What is …	Answer
1	16 – 8		**6**	16 – 7	
2	14 – 5		**7**	12 – 5	
3	13 – 7		**8**	15 – 8	
4	11 – 8		**9**	17 – 9	
5	18 – 9		**10**	15 – 9	

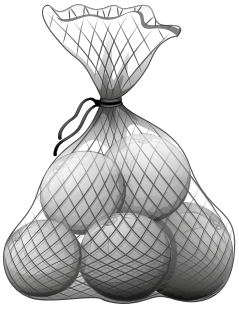
Link to previous lesson

1 3 568 294 + 5 442 321 = ☐

2 2 349 642 + 3 507 = ☐

Activity 1

Work with your whole class.



1. The farm workers picked 188 786 kg of oranges.
169 341 kg of oranges were sent to the market.
How many kg of oranges are left?

a Draw a diagram here to show the story and what you need to do with the numbers.

b Write a number sentence to show the calculation.

_____

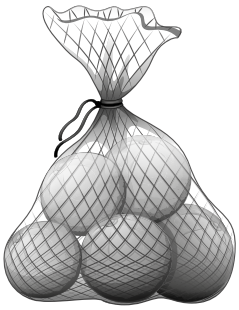
2 Use the column method to find the answer to the number sentence.

a Fill the numbers into the place value column. Don't forget to write the operation you are using on the left-hand side of the calculation.

b Do the calculation.

	HTh	TTh	Th	H	T	O

c Complete the following:



188 786 – 169 341 = _____

There are _____ kg of oranges are left.

Activity 2

Work on your own.

1 Calculate: 6 432 697 − 3 241 256 = ☐

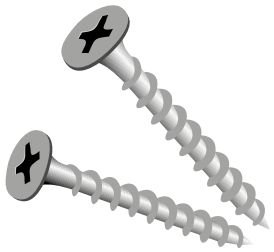
2 Solve: 3 840 637 – 2 234 724 = ☐

Activity 3

Work on your own.

1 Calculate: 4 021 741– 95 346 = ☐

2 A big factory manufactured screws.
They made 3 496 218 screws and sold 964 537 of them.
How many did they have left?



a Write the number sentence here:

_____

b Do the calculation here:

c Write the answer as a sentence:

_____

HOMEWORK

1 7 320 284 – 6 403 653 = ☐

2 4 159 600 – 1 235 216 = ☐

Lesson 11: Adding and subtracting decimal numbers

Mental maths

	What is ...	Answer		What is ...	Answer
1	6 + 8		**6**	16 – 8	
2	8 + 9		**7**	11 – 7	
3	6 + 6		**8**	17 – 8	
4	8 + 5		**9**	13 – 9	
5	7 + 6		**10**	15 – 6	

Link to previous lesson

Calculate

6 094 731 –193 652= ☐

Answer: _____

Activity 1

Work with the class on **1** and on your own on **2**.

1 Nkosi and Neo are twins.
Nkosi's mass was 3,74 kg when he was born.
Neo's mass was 2,56 kg when she was born.
What is Nkosi and Neo's mass in total?

a Draw a diagram here to show the story and what you need to do with the numbers.

b Write a number sentence to show the calculation.

_____

2 Use the column method to find the answer to the number sentence.

a Fill the numbers into the place value column. Don't forget to write the operation you are using on the left-hand side of the calculation.

b Do the calculation.

	O	,	t	h
_____				

c Complete the following:

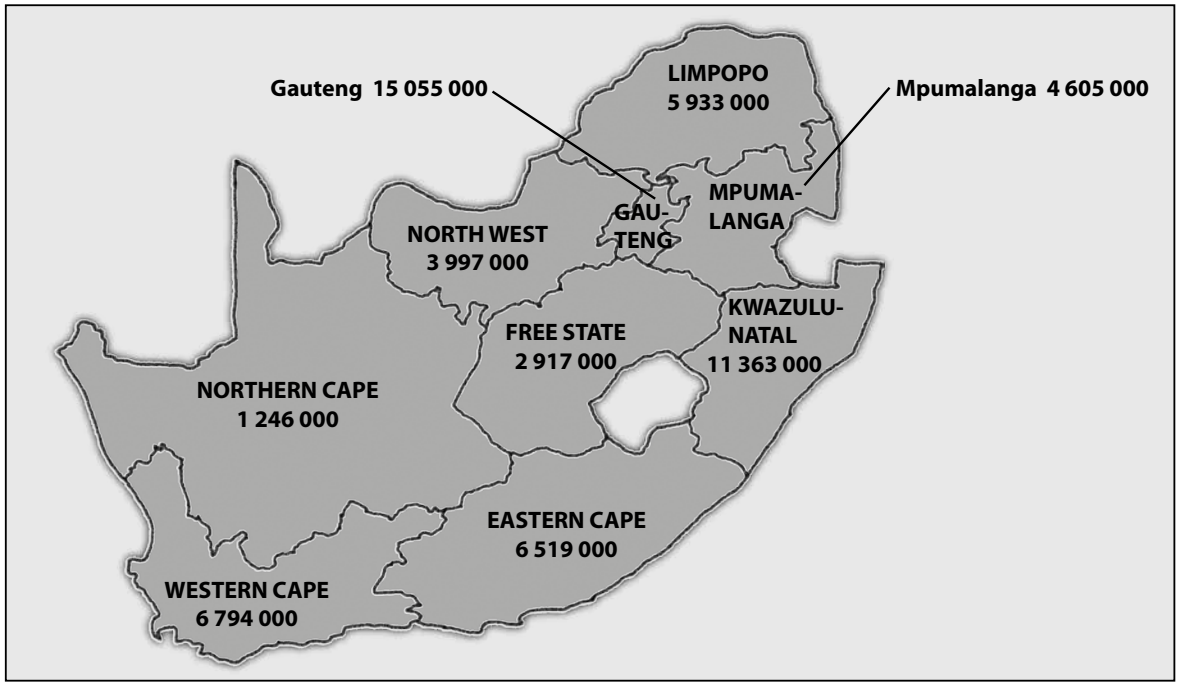
3,74 + 2,56 = _____

The combined mass of Nkosi and Neo is _____ kg.

Activity 2

Work on your own

This map shows the population of the provinces in South Africa in 2019.



1 The population of the Eastern Cape is 6 519 000.

If we write this population in millions only, correct to 2 decimal places, 6 519 000 is approximately equal to 6,52 million or 6,52 M.

The population of the Free State is 2 917 000.
If we write this population in millions only, correct to 2 decimal places, 2 917 000 is approximately equal to 2,92 million or 2,92 M.

Which two columns do you have to look at to round these numbers to two decimal places?

_____

2 Write the populations of the rest of the provinces in millions only, correct to two decimal places.

Province	MILLIONS			THOUSANDS			ONES			Populations in millions, correct to 2 decimal places
	HM	TM	M	HTh	TTh	Th	H	T	O	
Eastern Cape										6,52 M
Free State										2,92 M
Gauteng										
KwaZulu Natal										
Limpopo										
Mpumalanga										
Northern Cape										
Western Cape										

3 Use the answers in 2 to answer the following in millions, correct to 2 decimal places.

a Find the total population of Limpopo and Western Cape in millions.

Number sentence:
Total population of Limpopo and Western Cape

= _____ = ☐

	T	O		t	h
_____					_____

The total population of Limpopo and Western Cape is

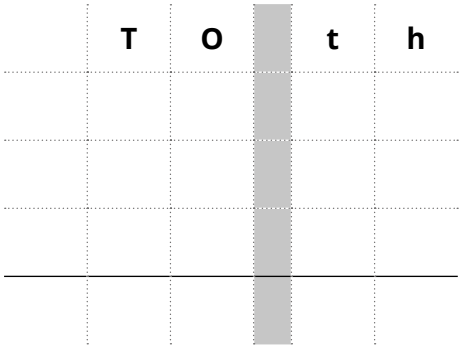
_____

b What is the difference in population between the Free State and Mpumalanga?

Number sentence:

Difference in population of the Free State and Mpumalanga

= _____ = ☐



The difference in the population of the Free State and Mpumalanga is

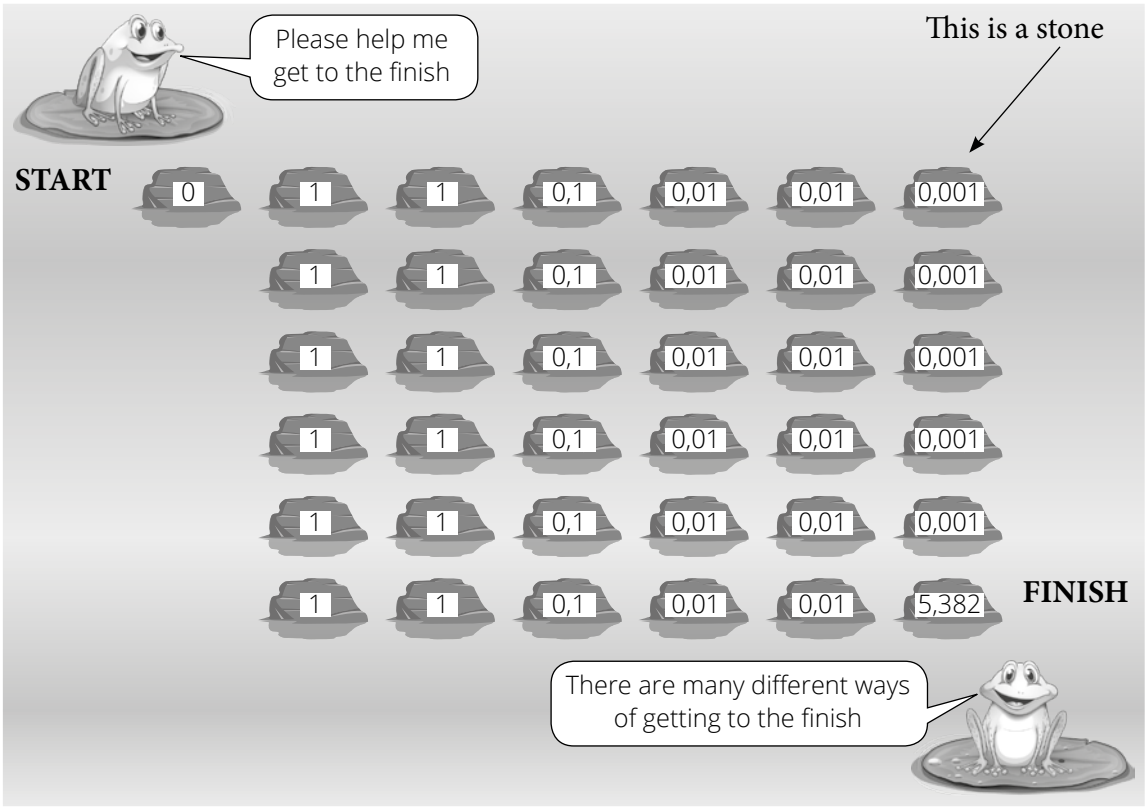
_____

Activity 3

Work on your own

Help the frog hop from the start to the finish, adding the numbers on the stones as he goes.

Colour the stones that the frog hops on.



Which stones did your frog hop on?

_____

_____

_____

_____

HOMEWORK

1 **a** 5,72 + 2,54

	T	O	,	t	h

b 6,05 + 2,08

	T	O	,	t	h

c 3,06 + 0,87

	T	O	,	t	h

2 **a** 10,49 – 0,85

	T	O	,	t	h

b 6,56 – 2,59

	T	O	,	t	h

c 5,04 – 4,86

	T	O	,	t	h

Lesson 12: Consolidation

Work on your own

1 Round to the nearest 100:

a 4 438 239 _____

b 632 973 _____

c 649,92 _____

2 Round to the nearest 1 000:

a 341 204 _____

b 4 689 009 _____

c 299 999 _____

3 Round to the nearest whole number:

a 3,09 _____ **b** 4,96 _____ **c** 0,59 _____

4 **a** Draw a circle around the bigger number.

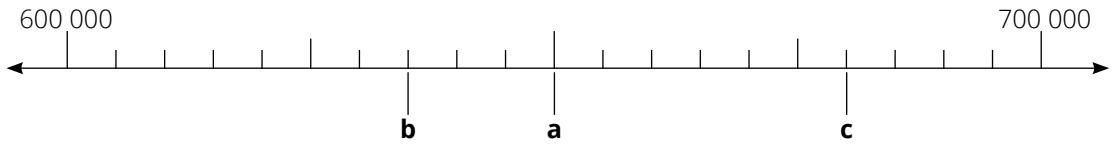
13 499 602 794 13 499 711 000

b Give a reason for your answer. _____

_____

_____

5 Write the correct numbers at **a**, **b** and **c**.



a _____

b _____

c _____

6. Calculate:

a 3 962 621 + 651 379 = ☐

b 2 761 406 – 1 739 129 = ☐

7 Calculate:

a 4,63 + 3,57 = ☐

b 2,98 + 3,64 = ☐

8 Calculate:

a 4,15 – 2,48 = ☐

b 6 – 5,69 = ☐

Learner Resources

Cut the place value cards out. Store them safely.

1	10	100	1 000
2	20	200	2 000
3	30	300	3 000
4	40	400	4 000
5	50	500	5 000
6	60	600	6 000
7	70	700	7 000
8	80	800	8 000

9	90	900	9000

10 000	20 000
30 000	40 000
50 000	60 000
70 000	80 000
90 000	

100 000	200 000
300 000	400 000
500 000	600 000

700 000	1 000 000
800 000	2 000 000
900 000	3 000 000

4 000 000	5 000 000
6 000 000	7 000 000

8 000 000

9 000 000

10 000 000

20 000 000

30 000 000

40 000 000

50 000 000

60 000 000

70 000 000

80 000 000

90 000 000

100 000 000	200 000 000
300 000 000	400 000 000
500 000 000	600 000 000
700 000 000	800 000 000
900 000 000	

1 000 000 000

2 000 000 000

3 000 000 000

4 000 000 000

5 000 000 000

6 000 000 000

7 000 000 000

8 000 000 000

9 000 000 000

10 000 000 000

20 000 000 000

30 000 000 000

40 000 000 000

50 000 000 000

60 000 000 000

70 000 000 000

80 000 000 000

90 000 000 000

100 000 000 000

200 000 000 000

300 000 000 000

400 000 000 000

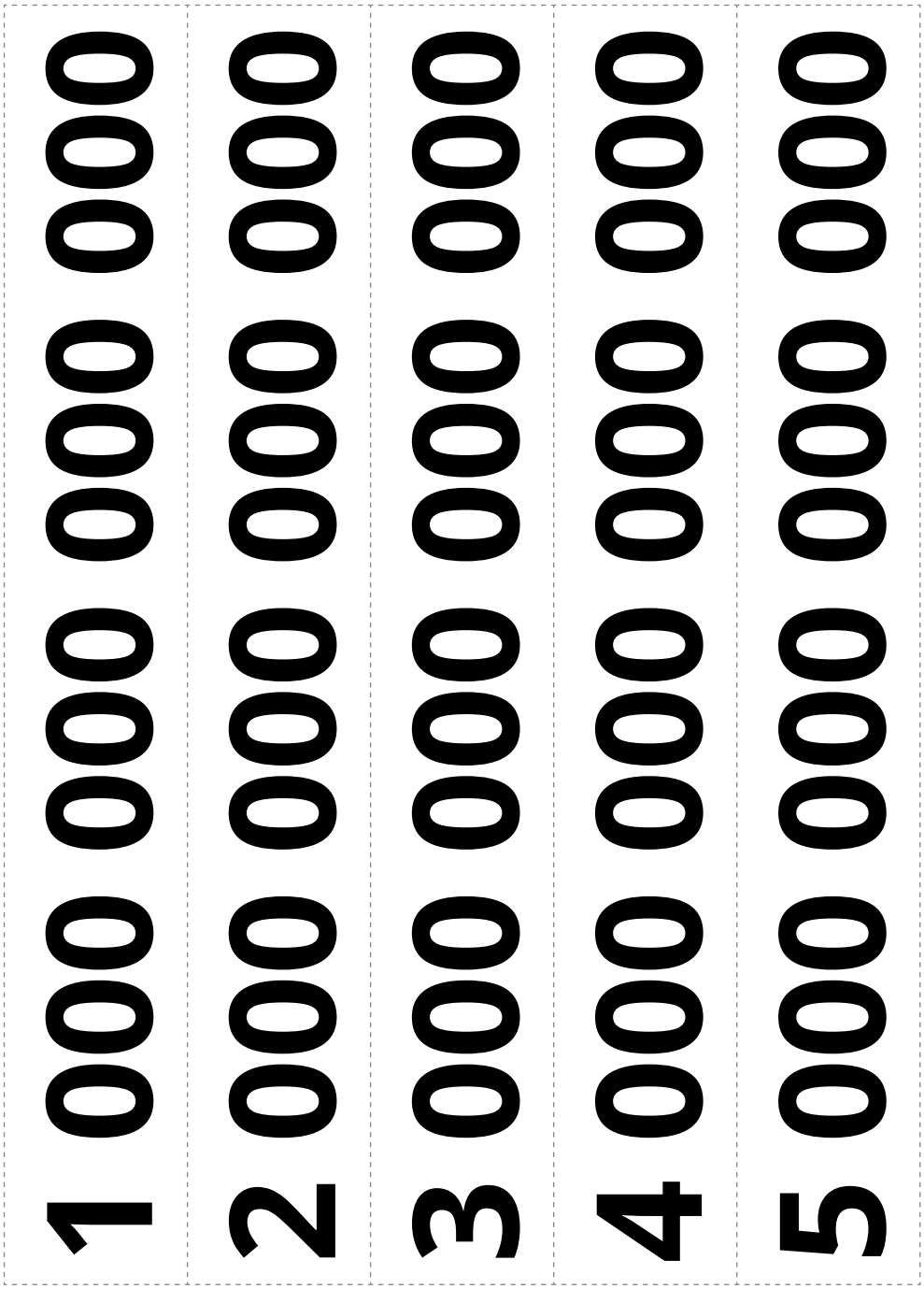
500 000 000 000

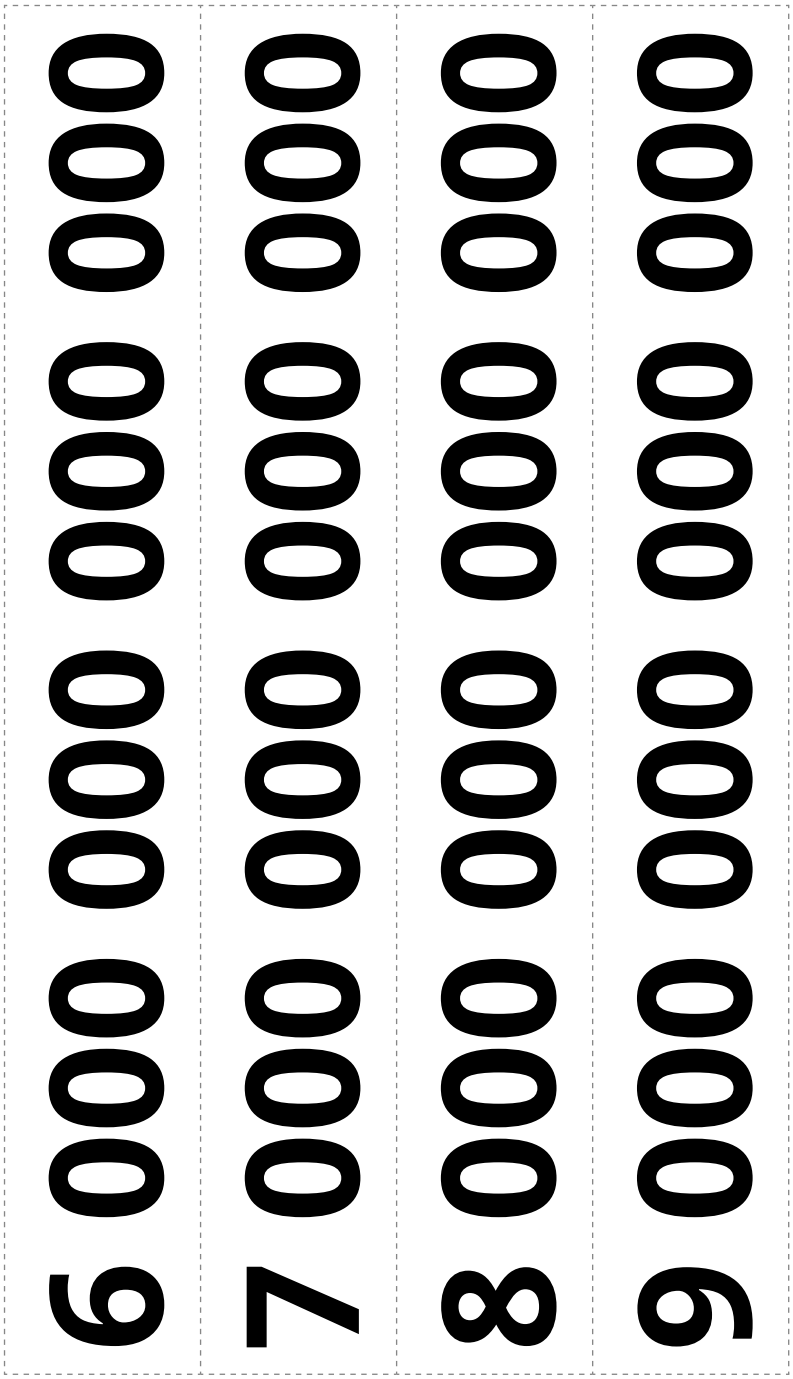
600 000 000 000

700 000 000 000

800 000 000 000

900 000 000 000

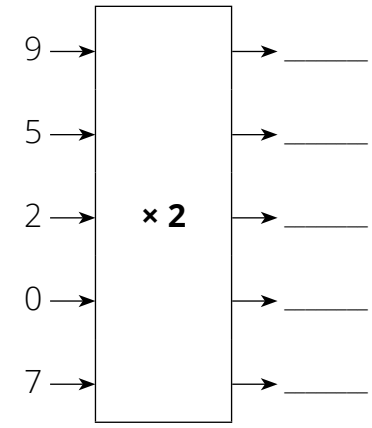

1 000 000
2 000 000
3 000 000
4 000 000
5 000 000


6 000 000
7 000 000
8 000 000
9 000 000

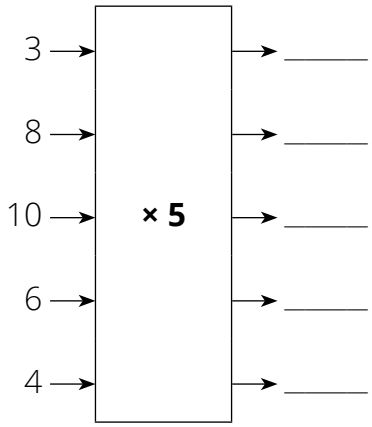
Lesson 13: Maths sentences and the order of operations

Mental maths

1 Complete the flow chart



2 Complete the flow chart

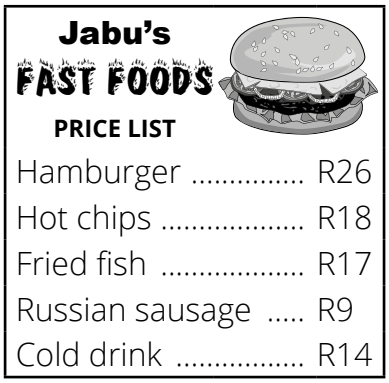


Activity 1

Work on 1 with your teacher and the whole class

Work on 2 with your partner

1 Sankie bought a hamburger.
She paid with a R50 note.
How much change should Sankie get?



a Underline the number in the problem with a straight line.

b Underline the question using a wavy line.

c How much does the hamburger cost? _____

d Write the word sentence here:

_____

e Write the number sentence and the answer here:

_____

f Write the answer in words.

_____

2 Manto uses a R20 note to buy a Russian sausage.
How much change should she get?

a Underline the number in the problem with a straight line.

b Underline the question using a wavy line.

c How much does a Russian sausage cost? _____

d Write the word sentence here:

_____

e Write the number sentence and the answer here:

_____

f Write the answer in words.

_____

Activity 2

Work with your partner

1 You buy fried fish and hot chips.
You use a R50 note.
How much change should you get?

a Look at the flashcards on the board.

Use the words on the flashcards to write a number sentence or number sentences that you can use to work out the answer.

_____

_____

b Write number sentences that you can use to work out the answer.

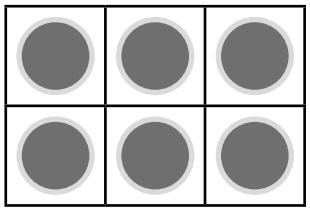
_____

c What is the answer?

_____

2 Duxie bakes and sells scones.
She packs the scones into a box like this:

How many boxes will she need to hold 60 scones?



3 scones in a row,
2 rows in a box

a Underline the numbers with a straight line and underline the question with a wavy line.

b Discuss with your partner how you can write a maths sentence that you can use to find out how many boxes Duxie needs.
Write the word sentence here:

_____

c Write a single number sentence. You can use a bracket if it is necessary.

_____

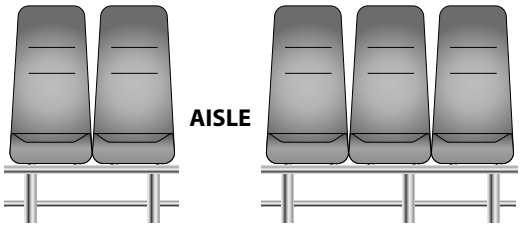
d Calculate the answer.

_____

Activity 3

Work on your own

On a bus, there are two seats on one side of the aisle and three seats on the other side like this:



How many rows of seats are needed to seat 50 people?

1 Underline the numbers with a straight line and underline the question with a wavy line.

2 Write a single number sentence you could use to find the answer.

Remember: We can use brackets to show which calculation to do first

Answer: _____

3 Use your number sentence to work out the answer.

Answer: _____

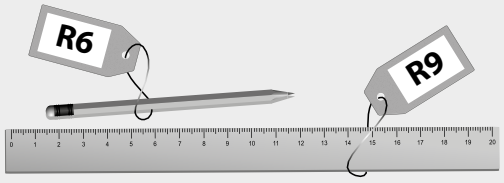
4 Write your answer in words:

_____

HOMEWORK

A pencil which costs R6 and a ruler which costs R9 are sold as a set.

How many pencil-ruler sets can a teacher buy if she has R150?



1 Underline the numbers with a straight line and the question with a wavy line.

2 Write a single number sentence you could use to find the answer.

_____

3 Use your number sentence to calculate the answer.

_____

4 Write the answer in words:

_____

Lesson 14: Using brackets

Mental maths

	What is …	Answer		What is …	Answer
1	6 × 3		**6**	7 × 3	
2	2 × 3		**7**	1 × 3	
3	0 × 3		**8**	5 × 3	
4	8 × 3		**9**	9 × 3	
5	10 × 3		**10**	4 × 3	

Link to previous lesson

Sam buys two bottles of cooking oil which cost R32 and R48 each.

He pays with a R100 note.

How much change should he get?

1 Underline the numbers with a straight line and underline the question with a wavy line.

2 Write a number sentence: _____

3 Find the answer: _____

4 Write the answer with the correct unit: _____

Activity 1

Work with the whole class

A tin of coffee costs R30 and a bag of sugar costs R20.

Four of your neighbours ask you to buy them a tin of coffee and a bag of sugar.

How much will this cost?

1 Underline the numbers using a straight line and underline the question using a wavy line.

2 Write a word sentence you could use to find the answer.

_____

3 Write a number sentence you could use to find the answer.

_____

4 Use your number sentence to find the answer.

_____

_____

_____

5 Write the answer in words.

The coffee and sugar for four people will cost _____

Activity 2

Work with your partner to answer the following:

Martha and Martin are saving to buy a present for their father.

Martha saves R6 per week and Martin saves R4 per week.

For how many weeks will they need to save to get R100?

1 Underline the numbers with a straight line and draw a wavy line under the question.

2 What you know from the problem

Savings per week: Martha _____ ; Martin _____

The goal amount = _____

3 Write a maths word sentence you could use to find the answer.

_____

4 Write a number sentence to find the answer.

_____

5 Find the answer.

_____

_____

_____

6 Write the answer in words.

_____

Activity 3

Work on your own to do the following calculations:

1 6 × (4 + 13)

= _____

= _____

2 100 – (65 – 30)

= _____

= _____

3 140 ÷ (4 + 10)

= _____

= _____

4 (97 – 43) ÷ 3

= _____

= _____

HOMEWORK

Calculate:

1 75 – (12 + 13)

= _____

= _____

2 980 + (300 – 180)

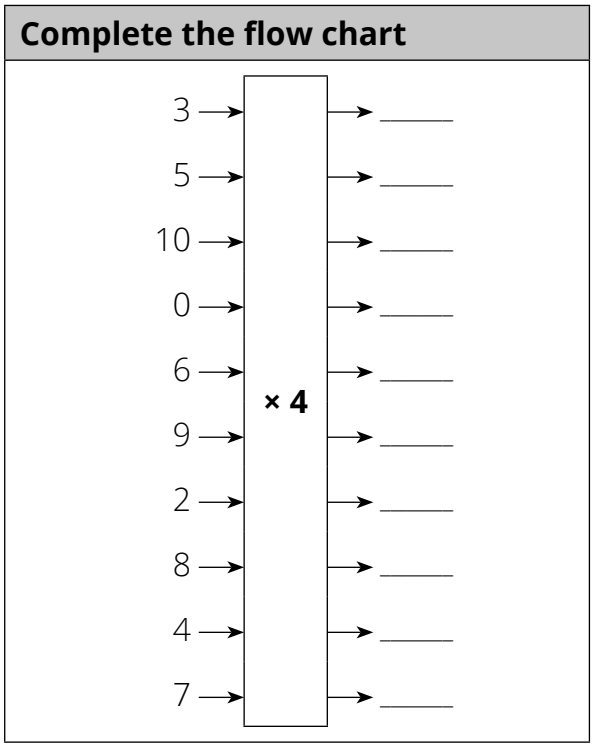
= _____

= _____

Lesson 15: Order of operations (1)

Mental maths

Complete the flow chart



Link to previous lesson

Add brackets to make the number sentences true.

1 $4 \times 3 + 12 = 60$ 2 $84 \div 6 - 3 = 28$ 3 $72 - 9 - 3 = 66$

Activity 1

Work on 1 on your own.

Work on 2 and 3 with your class.

1 Write a single number sentence for each problem and then solve the problem.

a Sam buys 3 bottles of cooking oil which cost R32,00 each. Sam pays with a R100 note. How much change should he get?

_____

_____

_____

Answer in words: Sam should get _____ change.

b Mary buys a pair of scissors which costs R50,00 and half a dozen pencils which cost R 70,00 per dozen. What is the total price that Mary must pay?

_____

_____

_____

Answer in words: Mary must pay _____.

c Siya buys 4 bags of potatoes that cost R15 each and 5 bags of carrots that cost R20 each. What is the total price that Siya must pay?

_____

_____

_____

Answer in words: Siya must pay _____.

> In mathematics, multiplication and division in the same number sentence must be done before addition and subtraction.

2 Find the answers to the following calculations:

a R 100 – 3 × R32

= _____

= _____

b R50 + R70 ÷ 2

= _____

= _____

c 4 × R15 + 5 × R8

= _____

= _____

3 Fill in the missing words in this sentence:

If you don't see any brackets in a number sentence with mixed operations, you always do _____ and _____ first.

Activity 2

Work on your own.

Solve:

1 700 – 6 × 90

= _____

= _____

2 60 + 240 ÷ 2 – 80

= _____

= _____

3 3 × 12 + 50 ÷ 2

= _____

= _____

4 90 + 72 ÷ 6

= _____

= _____

5 1 000 – 4 × 200

= _____

= _____

Activity 3

Work with a partner

Remember:
In mathematics, multiplication and division in the same number sentence must be done before addition and subtraction.

1 What is the total cost if you buy
1 packet of mealie meal for R16 and
5 small cabbages which cost R10 each?

a Pulane and Monga both worked out the answer.
Who is correct, Pulane or Monga?
Use calculations to support your answer.

Pulane got an answer of R66	Monga got an answer of R210

_____

_____

b Write the answer in words:

The total cost is R_____

2 You use a R50 note to buy 4 notebooks which cost R8 each.
What change will you get?

a Write a number sentence that you can use to solve this problem.

Number sentence: _____

b Work out your answer here:

_____

_____

c Write the answer in words.

The change is R_____

3 State whether true or false:

We only need to insert brackets when we need the order of calculation to be different from the rule.

_____

HOMEWORK

Calculate.
Use the rules for the order of operations to find the answers to these:

1 30 – 6 × 3 = _____

2 25 + 20 ÷ 5 = _____

3 6 × 5 – 15 ÷ 5 = _____

4 (6 + 4) × 7 = _____

Lesson 16: Order of operations (2)

Mental maths

	What is ...	Answer		What is ...	Answer
1	7 × 6		**6**	2 × 6	
2	1 × 6		**7**	6 × 6	
3	9 × 6		**8**	3 × 6	
4	4 × 6		**9**	8 × 6	
5	10 × 6		**10**	5 × 6	

Link to previous lesson

What is the total cost if you buy
6 soccer balls at R90 each and
5 netballs at R60 each?

R90

R60

1 Write a number sentence and then calculate the answer.

_____

_____

_____

2 Write the answer in words. Don't forget to include the unit.

_____

Activity 1

Work with your class.

1 Use the order of operation rules to find the answer to 20 – 10 + 2 = ☐

Answer: _____

2 Now calculate 20 – 10 ÷ 2 = ☐

Answer: _____

Activity 2

Work on your own.

ORDER OF OPERATION RULES

- Calculate inside the brackets first.
- Calculate multiplication or division before addition and subtraction.

1 Find the answer. Show the order that you did the calculation. Explain your reason for the order you chose.

a 12 – 6 + 2

Reason: _____

b 12 – (6 + 2)

Reason: _____

c 12 ÷ 6 × 2

Reason: _____

d $12 \div (6 \times 2)$

Reason: _____

e $12 + 6 \div 2$

Reason: _____

f $(12 + 6) \div 2$

Reason: _____

2 State whether true or false:

a If there are brackets, we always do the calculation inside the brackets first.

_____

b If there are no brackets, addition or subtraction are done before multiplication or division.

_____

c If a number sentence only has multiplication or division, we calculate from left to right.

_____

Activity 3

Work on your own first and then share your order of operations and the answer with your partner.

Find the answer showing the order of operations you used and explain the reason for getting the answer you did.

1 $5 \times 8 - 6 \div 2$

_____

_____

_____

_____

Reason: _____

2 $5 \times (8 - 6 \div 2)$

_____

_____

_____

_____

Reason: _____

3 $5 \times (8 - 6) \div 2$

_____

_____

_____

_____

Reason: _____

4 $(5 \times 8 - 6) \div 2$

_____

_____

_____

_____

Reason: _____

HOMEWORK

Choose the correct calculation order rule and then find the answer.

1 16 – 2 + 2 = ☐

Rule: _____

Calculation: 16 – 2 + 2 = _____

2 16 – (2 + 2) = ☐

Rule: _____

Calculation: 16 – (2 +2) = _____

3 16 ÷ 2 × 2 = ☐

Rule: _____

Calculation: 16 ÷ 2 × 2 = _____

4 16 ÷ (2 × 2) = ☐

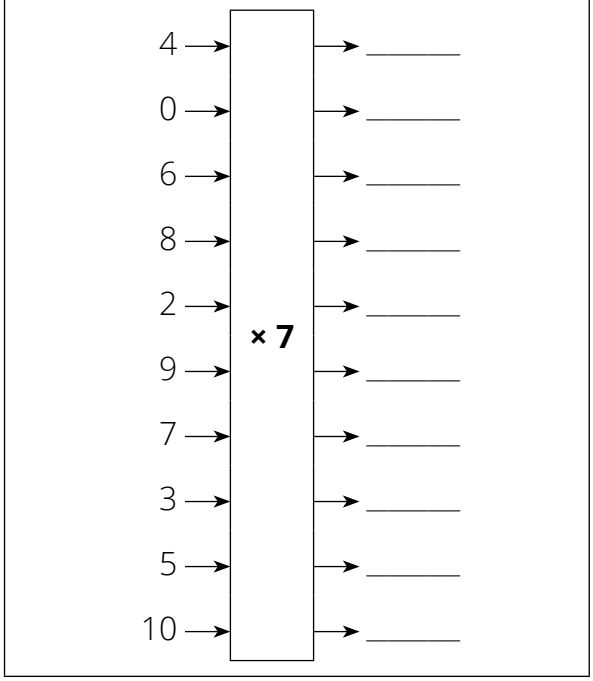
Rule: _____

Calculation: 16 ÷ (2 × 2) = _____

Lesson 17: Properties of operations

Mental maths

Complete the flow chart



Link to previous lesson

Robert and Busi calculated 3 × 10 + 5 × 2.

They were surprised to find that they got different answers.

Robert's answer was 70 and Busi's answer was 40.

Explain how each of them got their answers.

_____

_____

Who is correct? _____

Why? _____

Activity 1

Work on the questions with your teacher and the whole class

1 **a** Calculate the answers to the following:

8 + 10 = _____

10 + 8 = _____

b What do you notice about the two answers?

_____

2 Look at ▲ + ● = ● + ▲ where ▲ and ● represent any numbers.

a Do you think we can put any numbers in the place of the ▲ and ● in ▲ + ● = ● + ▲?

_____

b Try some numbers with your partner.

3 Are these sentences true or false?

a 49 – 13 = 13 – 49 _____

b 297 – 36 = 36 – 297 _____

4 Are these sentences true or false?

a $5 \times 3 = 3 \times 5$ _____

b $12 \times 10 = 10 \times 12$ _____

5 Look at ▲ × ● = ● × ▲ where ▲ and ● represent any numbers.

a Do you think we can put any numbers in the place of the ▲ and ● in ▲ × ● = ● × ▲?

_____

b Try some numbers with your partner.

Activity 2

Work on this activity with your teacher and the whole class.

Gugu has a spaza shop.

She bought 5 bags of mealie meal at R70 each and 5 bags of rice at R30 each to sell in her shop.

R70,00 each

R30,00 each

1 How much did Gugu spend altogether?

a Write a single number sentence that you can use to solve the problem.

_____

b Nomsa used the number sentence 5 × R70 + 5 × R30 to calculate her answer.

Use Nomsa's number sentence to work out the answer.
5 × R70 + 5 × R30

_____

_____

Explain why Nomsa used this number sentence.

_____

_____

c Esther used the number sentence 5 × (R70 + R30) to calculate her answer.

Use Esther's number sentence to work out the answer.
5 × (R70 + R30)

= _____

= _____

Explain why Esther used this number sentence.

_____

_____

d Nomsa and Esther used different number sentences. Did they get the same answer?

_____

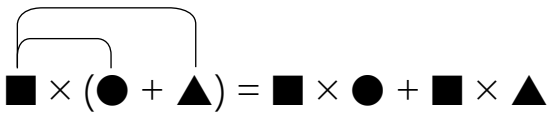
We can write what we found out like this:

NUMBER SENTENCE 1

We found that we can combine both number sentences as:

5 × (R70 + R30) = 5 × R70 + 5 × R30

OR



2 Remember that Gugu bought 5 bags of mealie meal at R70 each and 5 bags of rice at R30 each to sell in her shop.

R70,00 each

R30,00 each

She now wants to find the difference in the total cost of the mealie meal and the total cost of the rice.

a Gugu used the number sentence 5 × R70 – 5 × R30 to calculate her answer.

Use Gugu's number sentence to work out the answer.

5 × R70 – 5 × R30

= _____

= _____

So, she said that the difference in the total cost of the mealie meal and the total cost of the rice was (R200)

= _____

b Could Gugu have used the number sentence 5 × (R70 – R30) to calculate her answer?

Use Gugu's second number sentence to work out the answer.

5 × (R70 – R30)

= _____

= _____

c What do you notice about the answers in 2a and 2b.

= _____

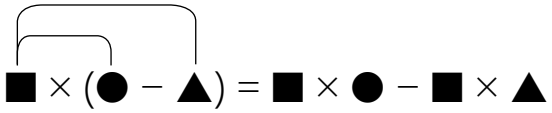
We can write what we found out like this:

NUMBER SENTENCE 2

We found that we can combine both number sentences as:

$5 \times (R70 - R30) = 5 \times R70 - 5 \times R30$

OR



3 Look at these two number sentences:
What is the difference between them?
■ × (● + ▲) = ■ × ● + ■ × ▲
■ × (● – ▲) = ■ × ● – ■ × ▲

_____

4 Now let's try some numbers instead of the ■, the ● and the ▲.
Suppose ■ = 5, ● = 4, and ▲ = 3.
Check whether number sentence 1 is true by writing the numbers instead of the symbols.

So, ■ × (● + ▲) = _____

And ■ × ● + ■ × ▲ = _____

So, is ■ × (● + ▲) = ■ × ● + ■ × ▲ always true?

_____

5 Instead of the ■, the ● and the ▲, write ■ = 10, ● = 18, and ▲ = 8. Check whether number sentence 2 is true by writing the numbers instead of the symbols.

So, ■ × (● − ▲) = _____

And ■ × ● − ■ × ▲ = _____

So, is ■ × (● − ▲) = ■ × ● − ■ × ▲ always true?

_____

HOMEWORK

1 Complete the number sentences.

a 6 + 5 = ____ + 6 = ____

b 15 = 6 + ____ = ____ + 6

c ____ × 9 = 9 × ____ = 90

d 13 × 7 = ____ and 7 × 13 = ____

2 State whether true or false. Explain.

a 13 + 6 = 6 + 13 _____

b 27 – 15 = 15 – 27 _____

Lesson 18: Relationships between calculations

Mental maths

	What is ...	Answer		What is ...	Answer
1	5 × 8		**6**	1 × 8	
2	9 × 8		**7**	6 × 8	
3	7× 8		**8**	0 × 8	
4	3 × 8		**9**	4 × 8	
5	10 × 8		**10**	8 × 8	

Link to previous lesson

1 Use the numbers ■ = 10; ● = 8 and ▲ = 5 to work out the answers.

a ■ × (● – ▲) = 10 × (8 – 5) = _____

b ■ × ● – ■ × ▲ = _____

2 Can we say that ■ × (● – ▲) = ■ × ● – ■ × ▲ is always true?

_____

Activity 1

Work on 1 with your teacher and the whole class
Work on 2, 3 and 4 with your partner

Properties of Operations	
1	● + ▲ = ▲ + ●
2	▲ × ● = ● × ▲
3	■ × (● + ▲) = ■ × ● + ■ × ▲
4	■ × (● – ▲) = ■ × ● – ■ × ▲
5	(■ + ●) + ▲ = ■ + (● + ▲)
6	(■ × ●) × ▲ = ■ × (● × ▲)

1 Find the answer to 31 + 26 + 14 = □

_____

_____

2 Each calculation shows two different ways of grouping the numbers to add. Draw a circle around the grouping you think will be easier and then find the answer.

a 23 + (17 + 29)
(23 + 17) + 29

Answer: _____

b (39 + 17) + 83
39 + (17 + 83)

Answer: _____

3 Insert brackets to show how you would group the numbers to make them easier to work out.
Then find the answer.

a 57 + 19 + 31

b 46 + 14 + 23

4 Insert brackets to show how you would group the numbers to make them easier to work out. Then find the answer.

a 57 × 25 × 4

b 8 × 35 × 2

Activity 2

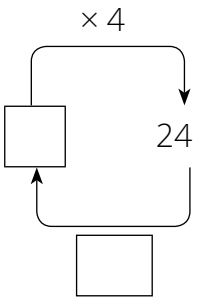
Work with a partner

1 Mother baked 24 scones.
Mother made 4 packets of scones with the same number of scones in each packet.
She wants to know how many scones there are in each packet.

Sizwe used a multiplication number sentence to work out the answer.
He used ☐ to represent the number of scones in a packet.
He wrote: $4 \times \square = 24$

a Sizwe then used a flow chart to show $4 \times \square = 24$.
He used the flow chart to change the order of the number sentence.

What should he write in the box? _____



b Use the inverse number sentence to calculate the number of scones in each packet.

_____

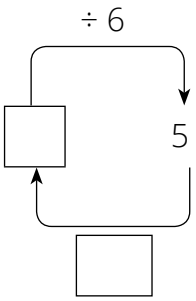
Answer: _____

2 The teacher divided a box of crayons amongst 5 learners.
Each learner got 6 crayons.
How many crayons were there in the box?

a Write a number sentence to represent the problem.
Use ☐ to represent the number of crayons in the box.

Answer: _____

b Use this flow chart to change the order of the number sentence.



c Use the inverse operation to find the answer.

Answer: _____

There were _____ crayons in the box.

Activity 2

Work on your own.

For each question, work out the value of ☐.

1 ☐ + 132 = 250

2 ☐ – 690 = 63

3 753 – ☐ = 63

4 8 × ☐ = 4 800

5) ☐ ÷ 8 = 125

HOMEWORK

For each question, work out the value of ☐.

1 ☐ × 6 = 54

2 ☐ + 15 = 47

3 ☐ – 75 = 325

4 ☐ ÷ 8 = 450

Lesson 19: How to read number sentences

Mental maths

	What is ...	Answer		What is ...	Answer
1	6 × 9		**6**	4 × 9	
2	0 × 9		**7**	10 × 9	
3	9 × 9		**8**	2 × 9	
4	5 × 9		**9**	7 × 9	
5	8 × 9		**10**	3 × 9	

Link to previous lesson

Use inverse operations to find the missing number.

1 ☐ × 9 = 54

2 ☐ + 100 = 301

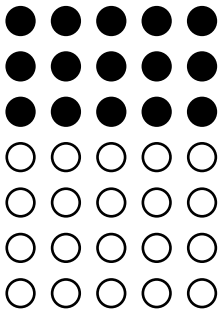
3 ☐ – 8 = 54

4 ☐ ÷ 9 = 7

Activity 1

Work with the whole class and then on your own.

1 Look at these counters.



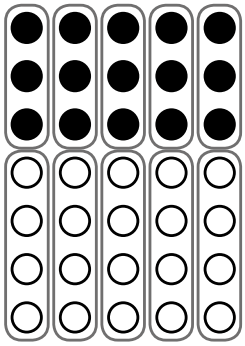
Three learners developed different number sentences to find the total number of counters as follows:

Learner 1: $3 \times 5 + 4 \times 5 = 15 + 20 = 35$

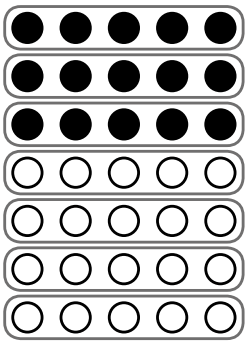
Learner 2: $5 \times (3 + 4) = 5 \times 7 = 35$

Learner 3: $5 \times 3 + 5 \times 4 = 15 + 20 = 35$

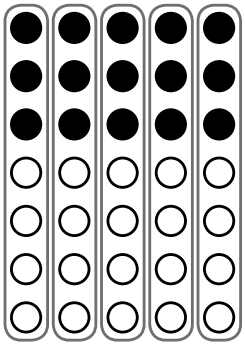
Match each picture with one of the learners' number sentence



Learner _____



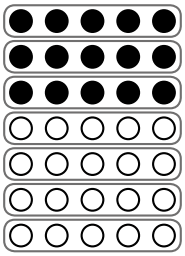
Learner _____



Learner _____

2 Explain how the diagrams can help you work out the answer to each of the number sentences.

a $3 \times 5 + 4 \times 5 = \square$



Are the counters grouped horizontally or vertically?

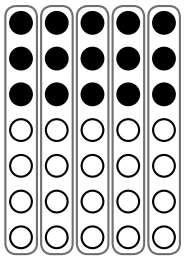
_____

What do the coloured counters and groupings show?

Work out the answer:

$3 \times 5 + 4 \times 5 =$ _____

b $5 \times (3 + 4)$



Are the counters grouped horizontally or vertically?

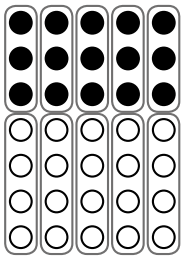
_____

What do the coloured counters and groupings show?

Work out the answer:

$5 \times (3 + 4) =$ _____

c $5 \times 3 + 5 \times 4$



Are the counters grouped horizontally or vertically?

_____

What do the coloured counters and groupings show?

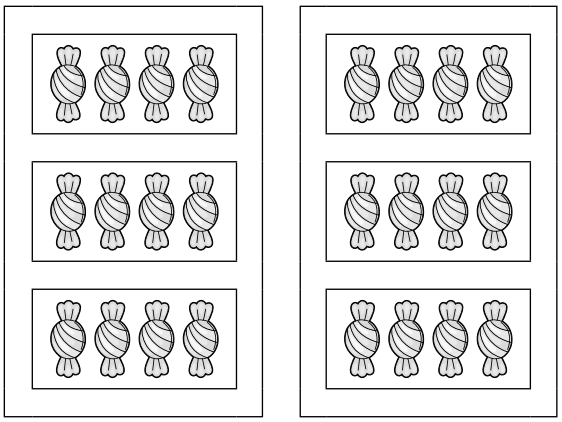
Work out the answer:

$5 \times 3 + 5 \times 4 =$ _____

Activity 2

Work with a partner

- This picture shows **two big boxes**.
- Inside each big box are **three small boxes**.
- Inside each small box are **four sweets**.



We can use two different number sentences to work out the total number of sweets in the picture.
Explain how each number sentence is used to find the total number of sweets.

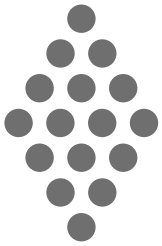
1 $2 \times (3 \times 4)$

2 $(2 \times 3) \times 4$

Activity 3

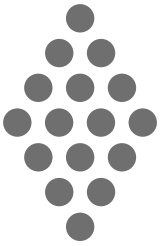
Work with the whole class and then on your own.

1 Siya wrote 5 × 3 + 1 = 16 for working out the total number of counters on this diagram.



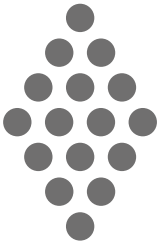
Draw loops around the counters on the diagram to explain Siya's number sentence.

2 Thule wrote 4 × 4 = 16 for working out the total number of counters on the diagram.



Draw loops around the counters on the diagram to explain Thule's number sentence.

3 Makhosi wrote 2 × 6 + 4 = 16 for working out the total number of counters on the diagram.



Draw loops around the counters on the diagram to explain Makhosi's number sentence.

HOMEWORK

Number sentences can be used to work out the number of counters in a pattern.

1 Use the picture of the pattern to explain this number sentence.

$4 \times 4 + 3 \times 3 = 25$

2 Use the picture of the pattern to explain this number sentence.

$6 \times 4 + 1 = 25$

Lesson 20: Consolidation

1 Find the missing number:

a ☐ × 8 = 48

c ☐ – 12 = 24

b ☐ + 30 = 95

d ☐ ÷ 9 = 5

2 **a** Complete the table by writing the answer in the space given.

a	2 × 5 × 3 = _____	(2 × 5) × 3 = _____	2 × (5 × 3) = _____
b	2 × 4 × 6 = _____	(2 × 4) × 6 = _____	2 × (4 × 6) = _____

b. Answer Yes or No.

When we multiply three or more numbers, does it matter how we group the numbers.

_____

Depending on how we group the numbers, will the answer always be the same?

_____

3 Mpumi owns 12 trucks.
10 of the trucks have 18 wheels, while 2 of the trucks have 6 wheels.
How many wheels altogether?

4 It is 1 750 km from Cape Town to Polokwane.
Abie takes three days to travel from Cape Town to Polokwane.
On day 1 he travels 580 km.
On day 2 he travels 620 km.

How many kilometres must he travel on day 3?

5 Draw a circle around the correct number sentence. Think carefully about order of calculation.

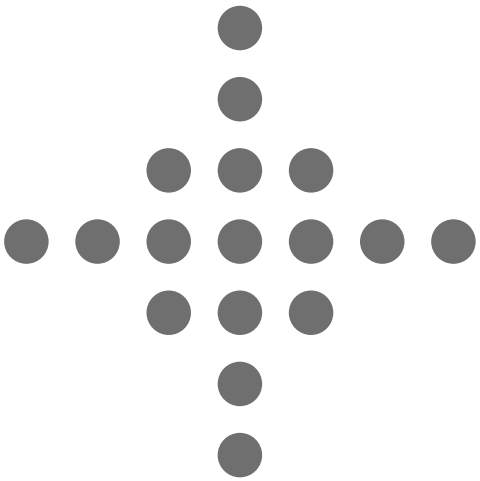
a The answer is 24.

$9 \times 3 - 3$ $9 \times (3 - 3)$ $9 + 3 \times 3$

b The answer is 37.

$8 \times (4 + 5)$ $8 + 4 \times 5$ $8 \times 4 + 5$

6 Explain how this diagram can help you work out the answer to the number sentence, $3 \times 3 + 4 \times 2$.



Lesson 21: Circles

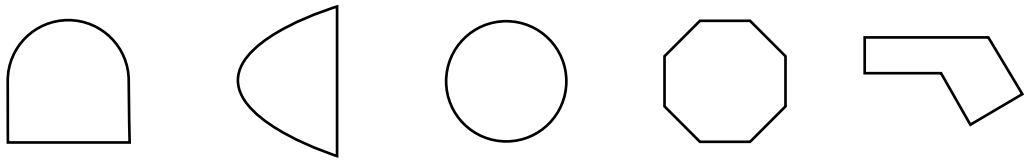
Mental maths

		Answer			Answer
1	20 ÷ 2		**6**	30 ÷ 5	
2	Half of 18		**7**	35 ÷ 5	
3	16 ÷ 2		**8**	40 ÷ 5	
4	Half of 12		**9**	20 ÷ 5	
5	14 ÷ 2		**10**	45 ÷5	

Link to previous lesson

Use a coloured pencil.

Colour in the circle.



Activity 1

Work with a partner to make your own three spinning tops.

You will need a sheet of paper, a pair of scissors, pencil, a toothpick, glue.

1 Cut out three different shapes from the paper. These could be a square, a circle, a triangle or even a shape with no name. These will be your three tops.

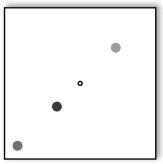
2 Find the centre of each top.

Draw three dots of different colours anywhere you like on each top.

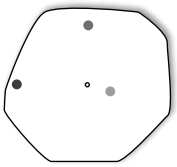
Make some dots close to the centre. Make some far from the centre.

Three different Tops are shown below:

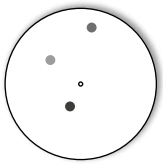
Top 1



Top 2



Top 3



3 Push the toothpick or pencil through the centre of your first top.

4 Spin your first top.

What shape do the dots make when you spin each top? (Circles)

Draw the shapes made by each spinning top here:

Top 1	Top 2	Top 3

Activity 2

Work on your own as your teacher guides you.
Your teacher will give you a paper circle.
You will also need a ruler, a pencil and glue

1 Find the centre of a circle.

2 Label the centre of your circle.

New word

The central point, or middle, of a circle is called the **centre of the circle**.

3 Draw and label a radius on your circle.

4 Draw some more radii and measure their length. What do you notice?

New word

A straight line drawn from the centre to any point on the circle is called the **radius**.

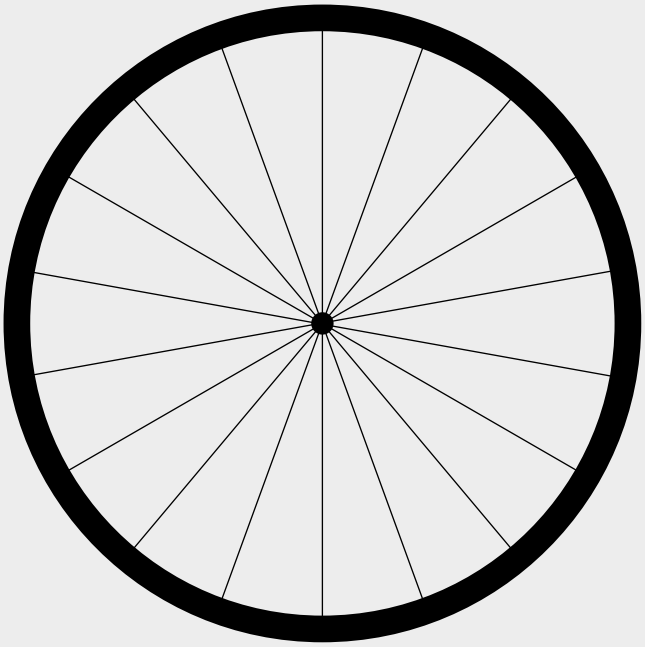
_____

_____

5 Paste your labelled circle in the box:

HOMEWORK

Label the centre and radius on this bicycle wheel:



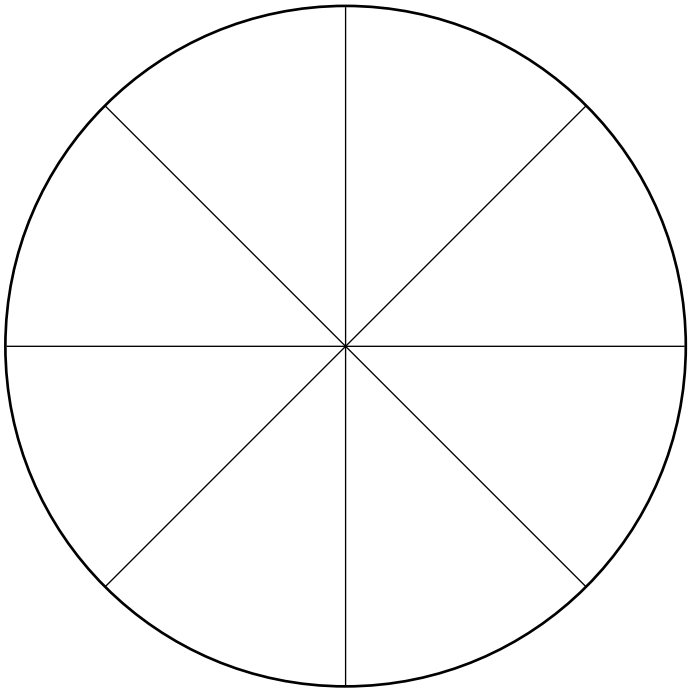
Lesson 22: Drawing circles

Mental maths

		Answer			Answer
1	12 ÷ 3		**6**	30 ÷ 5	
2	21 ÷ 3		**7**	35 ÷ 5	
3	3 ÷ 3		**8**	40 ÷ 5	
4	30 ÷ 3		**9**	20 ÷ 5	
5	15 ÷ 3		**10**	45 ÷5	

Link to previous lesson

Label the centre and radius of this circle.



Activity 1

Work with a partner

You will need a pin or drawing pin and a piece of string.

1 Talk with your partner about how you can use the pin or drawing pin and piece of string to draw a circle.

2 Draw a circle in the space below:

3 What part of the circle does the pin represent? _____

4 What part of the circle does the piece of string represent? _____

5 What shape does the pencil draw? _____

Activity 2

Work with a partner

You will need a ruler with two holes in it and two pencils.

1 Talk with your partner about how you can use the ruler and two pencils to draw a circle.

2 Draw a circle in the space below.
Hint: Think about how you could use the holes in the ruler.

3 What part of the circle does the pencil in the middle represent? _____

4 What part of the circle does the ruler represent? _____

5 What shape does the pencil draw? _____

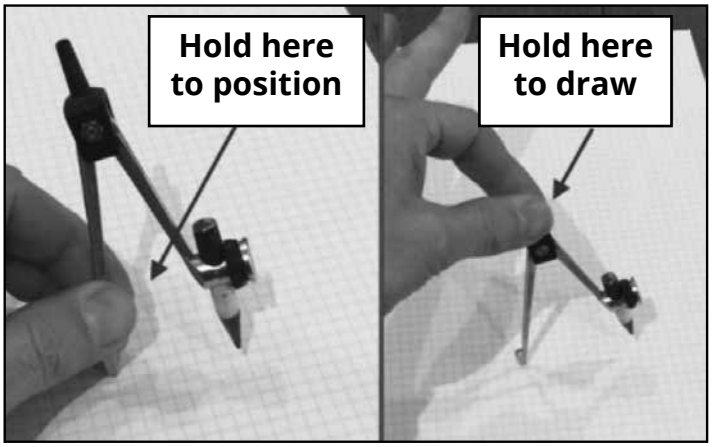
Activity 3

Work with your partner

You will need a pair of compasses and a sharp pencil. A short pencil works best.

Use the pair of compasses to draw as many different sized circles as possible in the space below.

This picture shows you how to hold the pair of compasses.



HOMEWORK

1 Use anything you can find at home to draw 2 circles of different sizes in the space below as accurately as you can.

2. Label the circle, the centre and the radius of each circle.

Lesson 23: The radius of a circle

Mental maths

		Answer			Answer
1	16 ÷ 4		**6**	24 ÷ 4	
2	40 ÷ 4		**7**	4 ÷ 4	
3	8 ÷ 4		**8**	28 ÷ 4	
4	32 ÷ 4		**9**	12 ÷ 4	
5	20 ÷ 4		**10**	36 ÷ 4	

Link to previous lesson

1 Use your pair of compasses to draw two different sized circles with the same centre.

2 Mark the centre of the two circles with a dot.

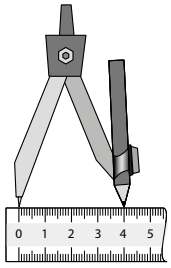
Activity 1

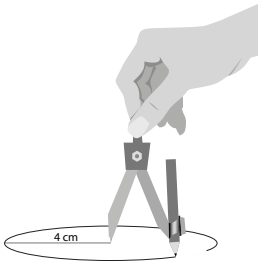
Work on your own.

You will need: pair of compasses, a sharp pencil and a ruler.

1 Measure 4 cm using your ruler and your pair of compasses.

a Draw a circle with a radius of 4 cm.
Use these pictures to help you draw the circle.





b Label the centre of the circle.

c Draw one radius. Write 4 cm on the radius.

2 Measure 3 cm using your ruler and your pair of compasses.

a Draw a circle with a radius of 3 cm.

b Label the centre of the circle.

c Draw one radius. Write 3 cm on the radius.

3 Measure 5 cm using your ruler and your pair of compasses.

a Draw a circle with a radius of 5 cm.

b Label the centre of the circle.

c Draw one radius. Write 5 cm on the radius.

Activity 2

Work on your own.

1 Go to Activity 1, question 1.

a Draw another 2 radii in the circle with a 4 cm radius that you drew in. (Remember we say 'one radius' but we say 'three radii".)

b Measure the length of each radius. Write the measurements in the empty box next to the circle.

2 Do the same for the circles you drew in Activity 1, question 2.

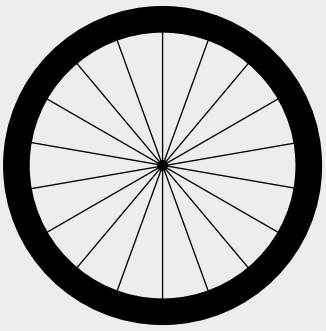
3 Do the same for the circles you drew in Activity 1, question 3.

4 Look carefully at the radius measurements in each circle.
Draw a ring around the correct word or words.

All radii in a circle are different / the same length.

HOMEWORK

Look at the picture of the bicycle wheel.



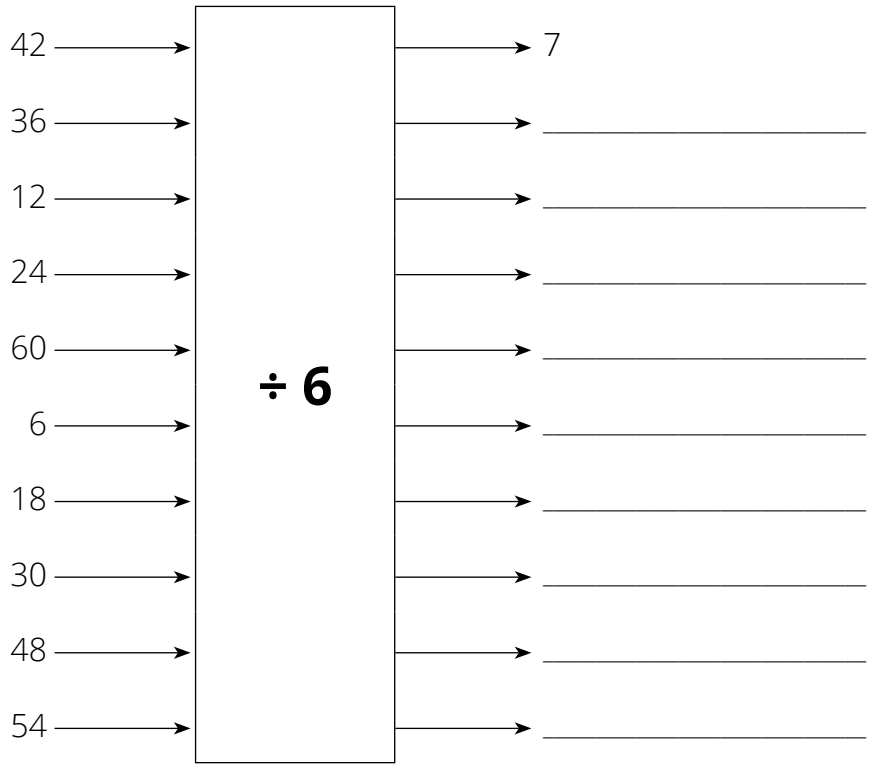
Write a sentence explaining why the spokes in a bicycle wheel must all be the same length.

Use the word radius in your answer.

Lesson 24: Diameters and patterns

Mental maths

Fill in the missing numbers. The first one has been done for you.



Link to previous lesson

Draw a line to match the word with the description.

circle	the middle of a circle
radius	flat, closed curve made up of points that are an equal distance from the centre
centre	straight line from the centre to any point on the circle

Activity 1

Work on your own

You will need a pair of compasses, a sharp pencil and a ruler

1 Draw a circle with a radius of 6 cm.
Draw a dot to show the centre of the circle.
Remember that where you placed the compass point when you drew the circle is the centre of the circle.

2 Draw 4 straight lines in the circle. One of the straight lines must go from a point on the circle, through the centre of the circle to a point on the opposite side of the circle.

3 Measure the length of each straight line.
Record the lengths in this table:

	Length
Line 1	
Line 2	
Line 3	
Line 4	

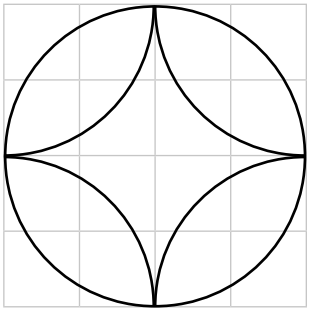
Activity 2

Work on your own

You will need a pair of compasses and a sharp pencil.

Copy this pattern on the squared paper.

Think carefully about where you place the point of the pair of compasses, especially when it comes to drawing the shapes inside the inside of the circle.

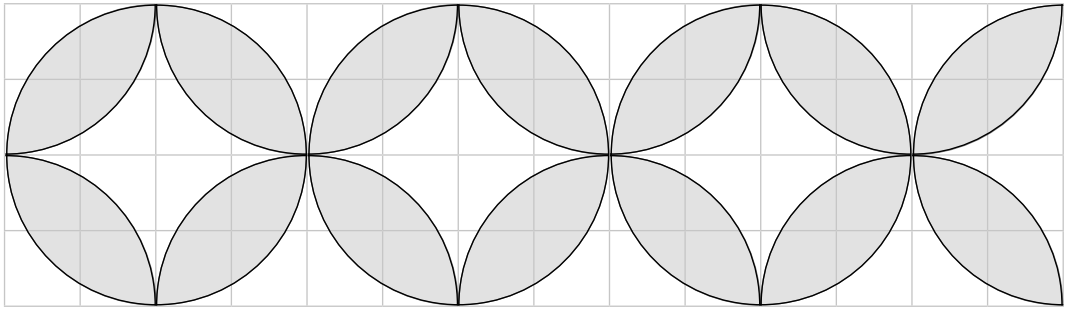


Activity 3

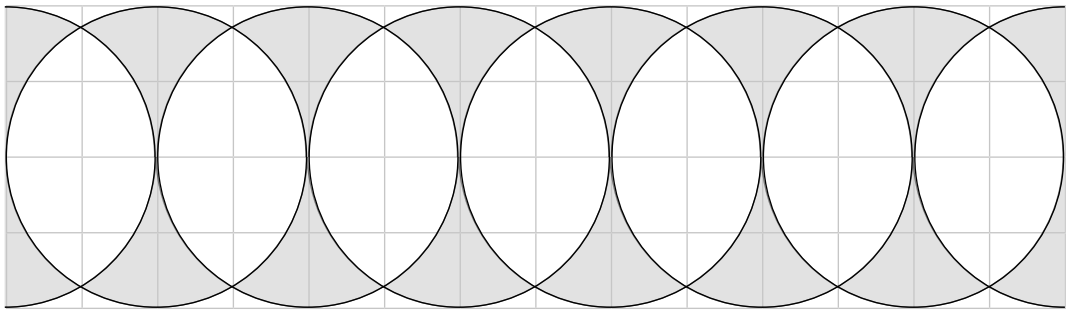
Work on your own

You need a pair of compasses, a sharp pencil, coloured pencils or crayons.

1 Draw this pattern on the squared paper.
Think carefully where you should place the compass point.

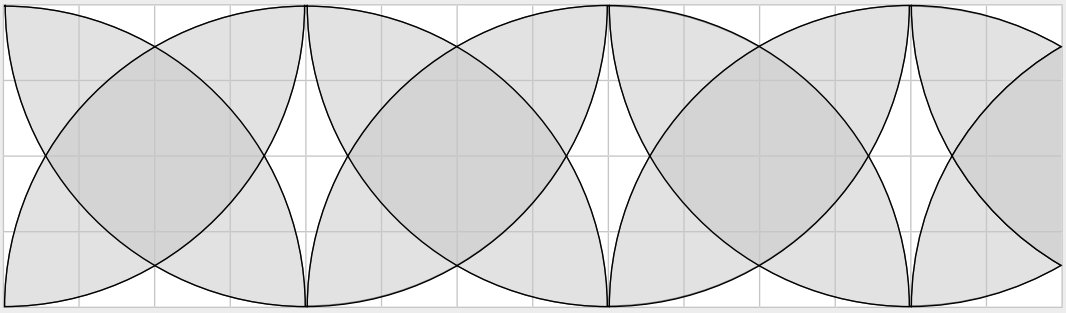


2. Draw this pattern on the squared paper.
Think carefully where you should place the compass point.



HOMEWORK

Draw this pattern on the given squared paper.
Think carefully where you should place the compass point.



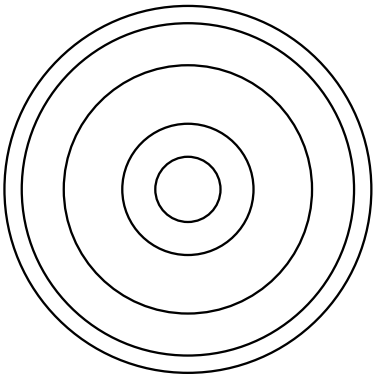
Lesson 25: Use a pair of compasses to measure distance

Mental maths

		Answer			Answer
1	35 ÷ 7		**6**	28 ÷ 7	
2	70 ÷ 7		**7**	7 ÷ 7	
3	14 ÷ 7		**8**	42 ÷ 7	
4	49 ÷ 7		**9**	56 ÷ 7	
5	21 ÷ 7		**10**	63 ÷ 7	

Link to previous lesson

Study this circle pattern.



Circle the word to complete the sentence correctly:

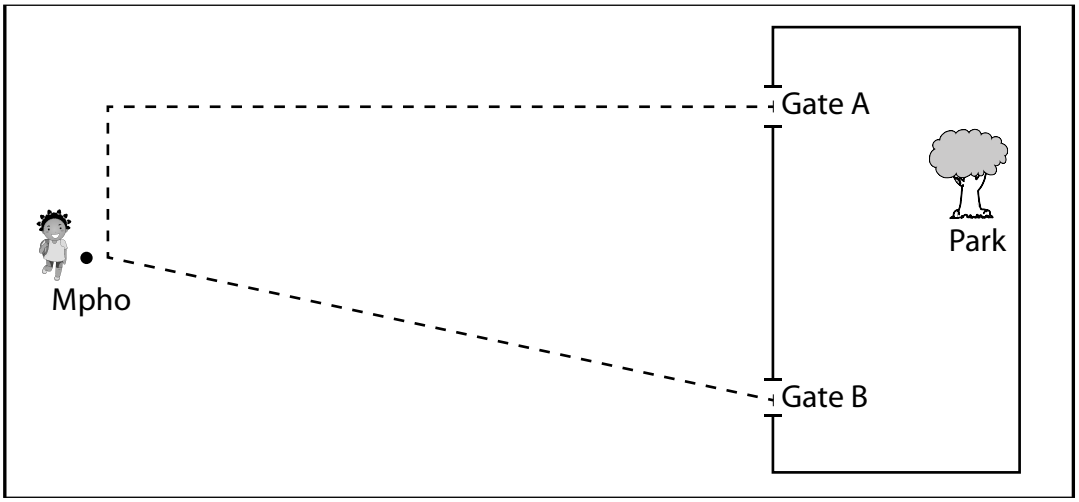
To draw this pattern, I needed to use the same centre / radius / diameter.

Activity 1

Work with a partner.

You are going to need a pair of compasses, a short pencil and a ruler.

Mpho wants to go to the park. Follow the instructions to work out which gate is closest to Mpho.



1 We can use a ruler to measure the distance from Mpho to Gate A and to Gate B. Write down how you would do this.

_____

_____

_____

2 We can use a pair of compasses to help us find which distance is shorter.

a Use your pair of compasses to copy each length of the route to Gate A onto the straight line below. Make a mark on the line between the two pairs of compasses.

b Use your pair of compasses to copy the length of the route to Gate B onto the second straight line below.

Route to Gate A _____

Route to Gate B _____

c Compare the two lengths and then decide which gate is closer for Mpho.

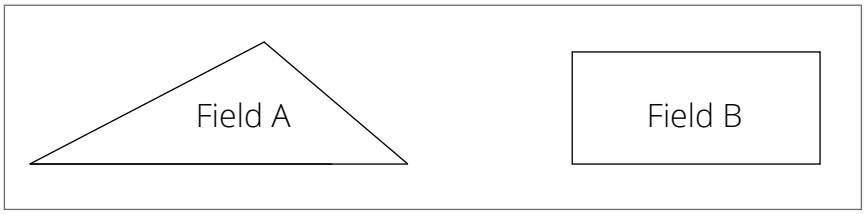
_____

Activity 3

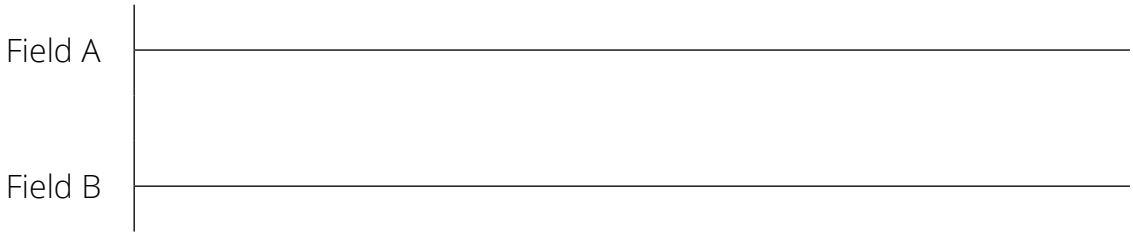
Work on your own

You will need a pair of compasses, a short pencil and a ruler.

A farmer has two fields on her farm. She wants to know which field has a longer outside edge or perimeter.



1 Use your pair of compasses to measure the lengths of the sides of Field A.
Mark off the length of each side on the line below.
Remember not to leave any space between each measurement.



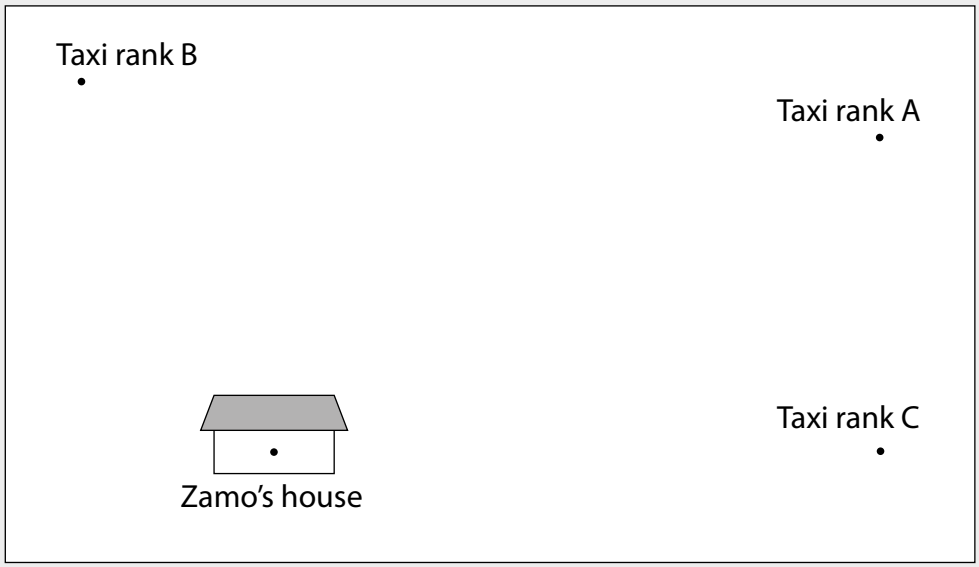
2. Now use your pair of compasses to measure the lengths of the sides of Field B.
Mark off the length of each side on the line above.
Remember not to leave any space between each measurement.

3. Which field has a longer outside edge? Answer: _____

HOMEWORK

You are going to need a ruler or a pair of compasses.

Zamo has three taxi ranks near his house.



1 Which taxi rank is closest to Zamo's house? Measure from dot to dot.

_____

2 How did you measure the distances?

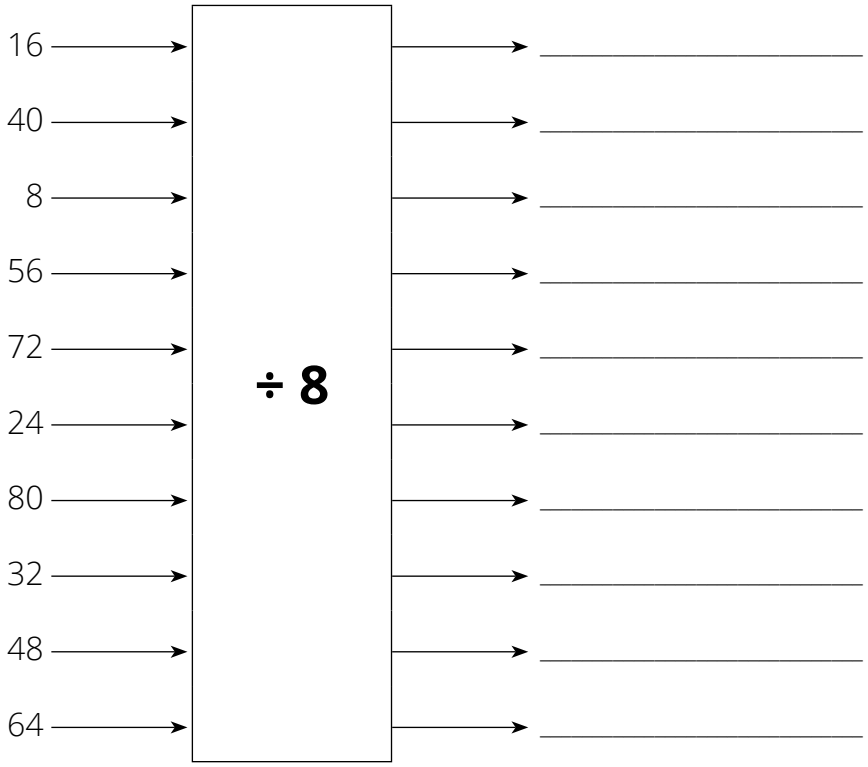
_____

_____

_____

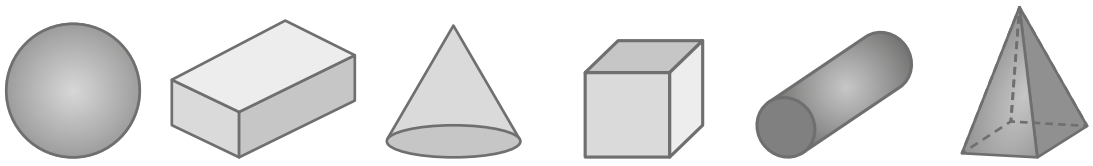
Lesson 26: Spheres

Mental maths



Link to previous lesson

These shapes are all 3-D Objects:



1 Which of these shapes have flat sides only? _____

2 Which of these shapes has a curved surface only? _____

3 Which of these shapes have flat and curved surfaces? _____

Activity 1

Work with a partner.

You need a pair of compasses.

1 Complete the table.

a Draw the shape you see when you look at the ball from above
b Draw the shape you see when you look at the ball from one side
c Draw the shape you see when you look at the ball from another side

2 Complete the sentence: A shape like a ball that looks like a _____ when viewed from any angle is called a _____.

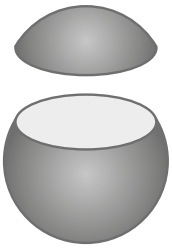
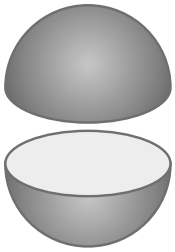
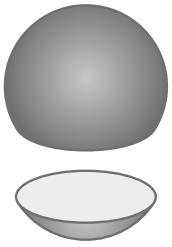
Activity 2

Work with a partner.

You are going to need a piece of clay, plasticine or Prestik/Bostik and something to cut it.

1 Make a ball with clay, plasticine or Prestik/Bostik.
Try to make the ball looks as much like a sphere as possible.

2 Look at the way that each of these spheres has been cut.
Cut your sphere and complete the table.

How each sphere has been cut.	What I see if I look at one of the cut surfaces from directly above
a 	
b 	
c 	

2. When did you have the largest circle?

_____

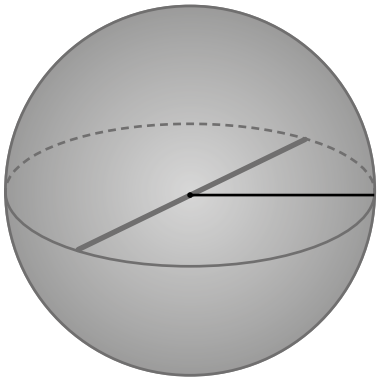
3. Complete the sentence:

The cut surface of a sphere is always a _____, no matter where you cut.

Activity 3

Work on your own

Fill in the labels centre, diameter and radius on this sphere.



HOMEWORK

Fill in the missing numbers or words.

1 The cut surface of a sphere is always a _____.

2 The centre of the sphere is the centre of a _____ that is formed when you cut the sphere in _____.

3 The diameter of a sphere is _____ times the radius of the sphere.

Lesson 27: Consolidation

1 Use a pair of compasses.

a Draw a circle with a radius of 5 cm.

b Label the radius, the centre and the diameter of the circle.

c What is the length of the diameter? _____

2. Use a pair of compasses.

a Draw a circle with a diameter of 8 cm.
Think carefully before you start!

b Label the radius, the centre and the diameter of the circle.

3 State whether each sentence is true or false.

If it is false, re-write the sentence to make it true.

a The radius is two times the diameter. _____

_____

_____

_____

b A pair of compasses can only be used to draw circles. _____

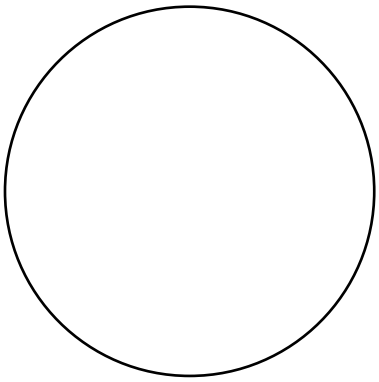
_____

_____

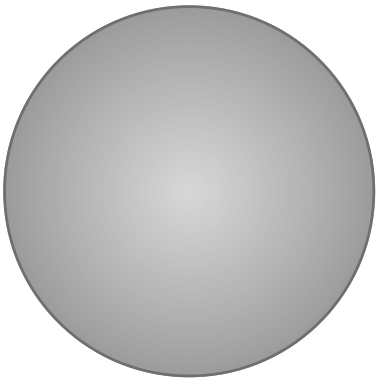
_____

4 Your friend wants to know what the difference is between a circle and a sphere.

Use the diagram below to help you write down what you are going to tell your friend.



circle

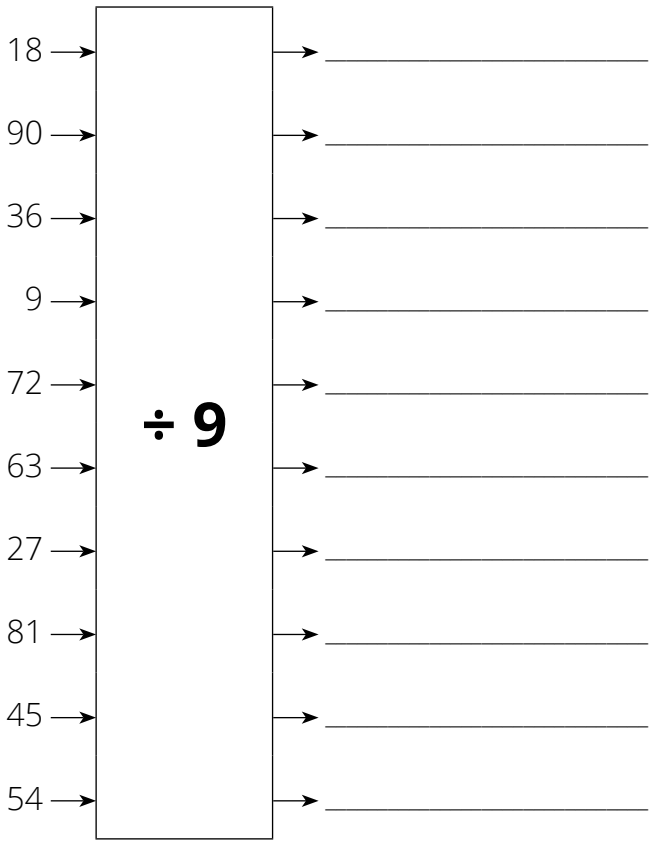


sphere

Lesson 28: Temperature and thermometers

Mental maths

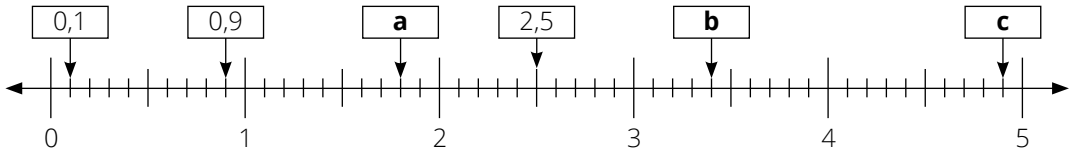
Complete the flow chart:



Link to previous lesson

Write down the missing numbers on these two number lines.

1

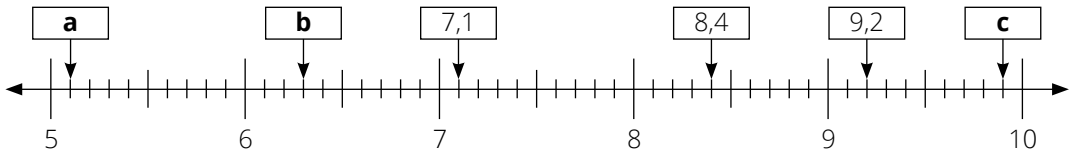


a _____

b _____

c _____

2



a _____

b _____

c _____

Activity 1

Work on your own

1 Measure your body temperature today and then every day for four more days. Record your body temperature on this record sheet:

Day	**My body temperature**
1	
2	
3	
4	
5	

2) Answer this when you have recorded your temperature for five days:

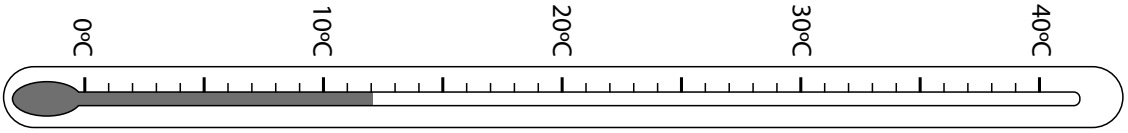
Is your temperature the same every day?

_____

Activity 2

Work with a partner

1 Look at the thermometer and then answer the questions.



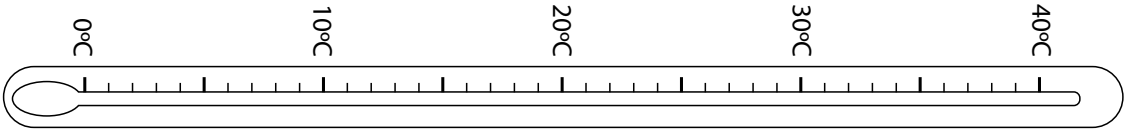
a What is the lowest temperature that can be read on this thermometer? _____

b What is the highest temperature that can be read on this thermometer? _____

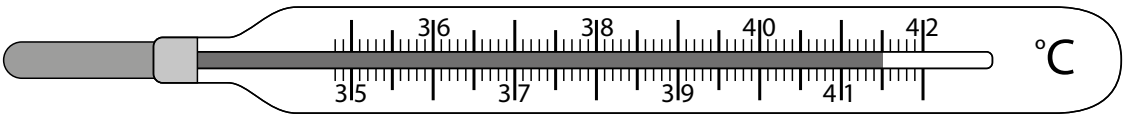
c How many degrees do each of the shorter lines represent? _____

d What temperature is shown on this thermometer? _____

2 Edy's temperature this morning was 37 °C.
Use a pencil to show 37 °C on this thermometer:



3 Look at the thermometer and then answer the questions.



a What is the unit of measurement on this thermometer? _____

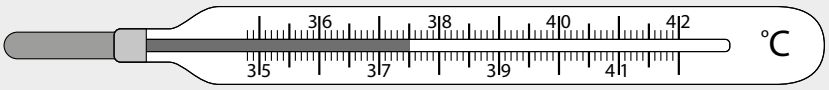
b State whether True or False
Each small line represents 0,1. _____

c What temperature is shown on this thermometer? _____

HOMEWORK

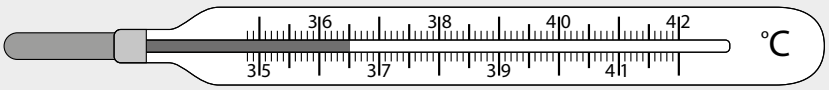
1 What is the temperature shown on each thermometer?

A



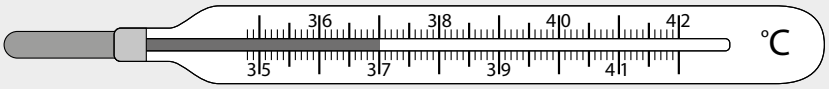
_____

B



_____

C



_____

2 Tshanda's temperature is 38,4 ºC.

a Write Tshanda's temperature on this thermometer:

b Do you think Tshanda might be sick? Give a reason for your answer.

_____

_____

_____

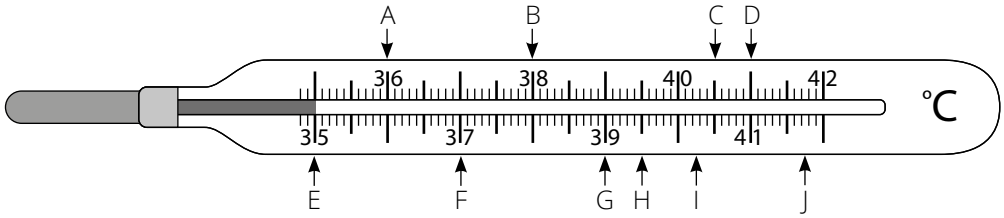
_____

_____

Lesson 29: Measuring temperature

Mental maths

Match each temperature with one of the letters (A-J) shown on the thermometer. The first answer has been filled in for you.

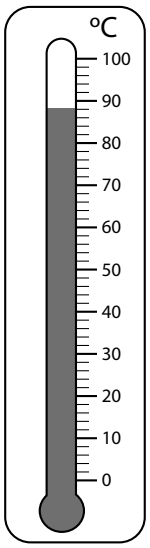


	Question	Answer		Question	Answer
1	36 °C	A	**6**	40,5 °C	
2	35 °C		**7**	Two degrees below 40 °C	
3	39,5 °C		**8**	39 °C	
4	37 °C		**9**	One degree above 40 °C	
5	41,8 °C		**10**	40,2 °C	

Link to previous lesson

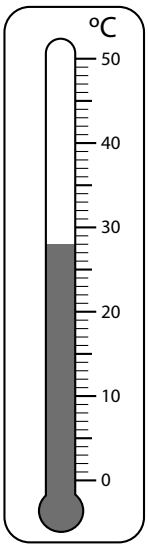
Write down the temperature shown on each thermometer.

1



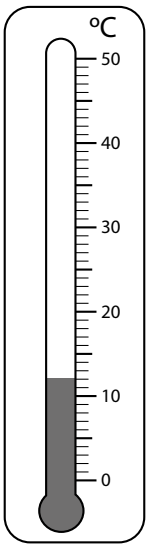
_____

2



_____

3

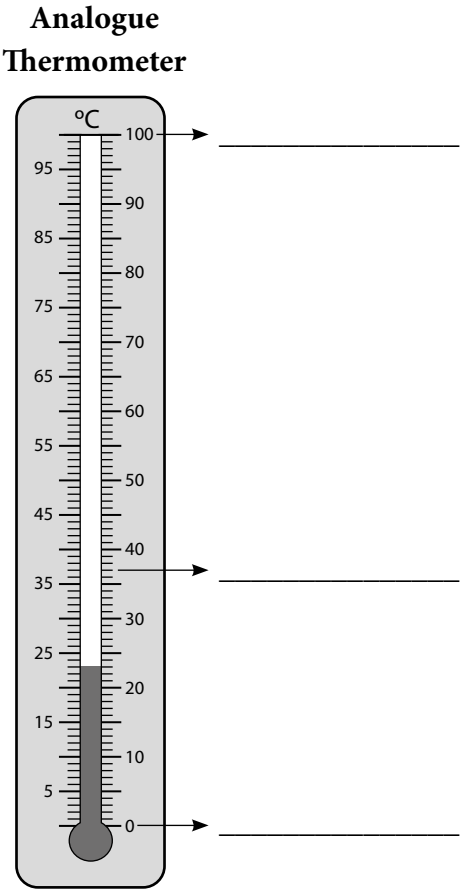


_____

Activity 1

Work with your partner.

1 Write the temperatures in the correct place next to the thermometer.



2 Draw a cross over the most likely temperature:

a The temperature of a very cold cool drink.	3 °C	37 °C	100 °C
b The temperature of a very hot drink.	30 °C	94 °C	0 °C
c Your body temperature one day.	18 °C	63 °C	37 °C
d The temperature of the air on a hot day.	18 °C	34 °C	68 °C

3 Read and record the temperature shown on each digital thermometer:

a 

_____

b 

_____

c 

_____

4 These baking instructions are given on a packet of frozen fish.

How to bake the fish in the oven

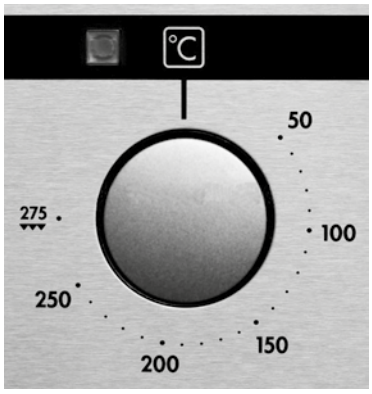
- Turn the oven on to 220 °C.
- Place fish on a baking tray and bake in the oven for approximately 25 minutes

Read the instructions and then answer the questions.

a At what temperature must the fish be baked? _____

b For how long should the fish be baked? _____

c Use an arrow to show the temperature on this oven thermometer at which the fish must be baked.



d Explain what would happen if you tried to bake the fish for 25 minutes at 300 °C.

_____

_____

_____

HOMEWORK

Draw a line to match the statement in Column A with the correct temperature in Column B.

Column A		Column B
Your temperature when you are healthy		42 ºC
The temperature on a very hot day in South Africa		0 ºC
The temperature inside your fridge		100 ºC
The temperature needed to make ice cubes		6 ºC
The temperature at which water boils		37 ºC

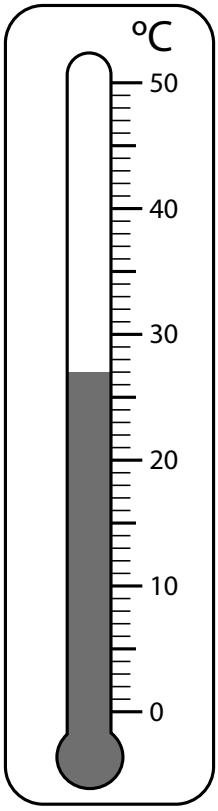
Lesson 30: Reading and recording temperature

Mental maths

Round off to the nearest multiple of 10

	Question	Answer		Question	Answer
1	43		**6**	976	
2	69		**7**	432	
3	55		**8**	8	
4	81		**9**	597	
5	172		**10**	214	

Link to previous lesson



1 How many degrees do the small lines represent? _____

2 What temperature is the thermometer showing? _____

3 What is the highest temperature you can read on this thermometer? _____

4 What is the lowest temperature you can read on this thermometer? _____

5 At what temperature does pure water freeze? _____

6 At what temperature does pure water boil? _____

7 Could you use this thermometer to measure whether water that has been heated is at boiling point? Why?

_____

_____

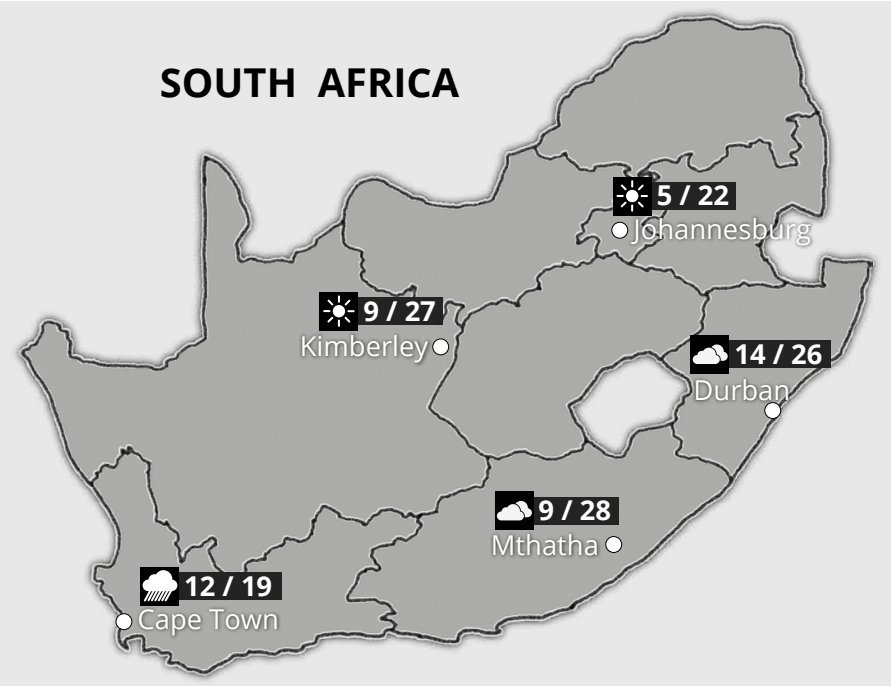
_____

Activity 1

Work with a partner

Record the maximum and minimum temperatures for each city in the table below. Then work out the difference between the minimum temperature and maximum temperature.

Temperatures in South Africa on 19 May 2021



	Minimum Temperature	Maximum Temperature	Difference between the maximum temperature and the minimum temperature
Cape Town			
Durban			
Johannesburg			
Kimberley			
Mthatha			

Activity 2

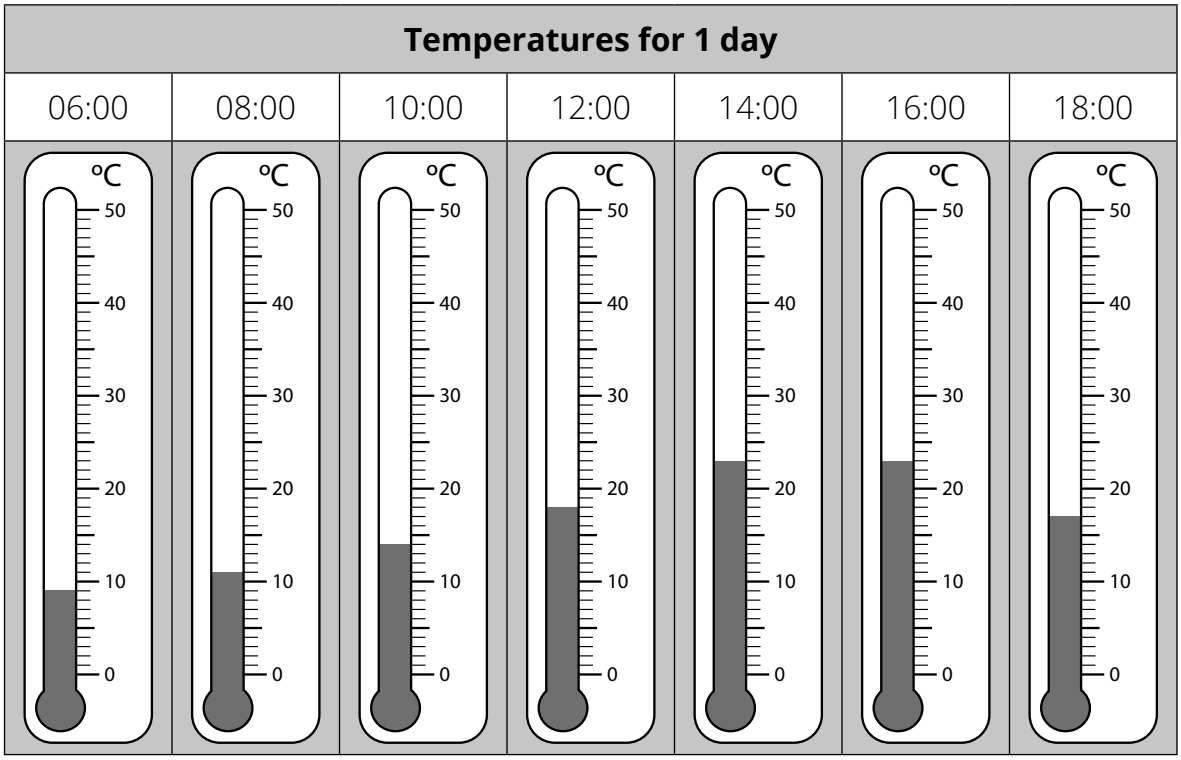
Work with your partner.

Zamo wanted to see how the air temperature changed during the day.

The thermometers below show the outside temperature every two hours during the day.

Read the temperature shown on each thermometer. Record the temperature readings in the table.

Temperatures for 1 day



Time	06:00	08:00	10:00	12:00	14:00	16:00	18:00
Temperature	____ °C	____ °C	____ °C	____ °C	____ °C	____ °C	____ °C

HOMEWORK

Draw a line to match the description to the temperature.

Description		Temperature
Temperature needed for making ice cubes		180 °C
Temperature of boiling water for tea		40 °C
Temperature needed for baking scones		100 °C
Temperature of a child sick with a fever		0 °C

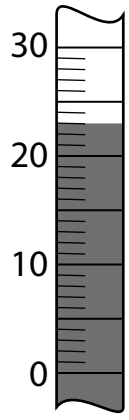
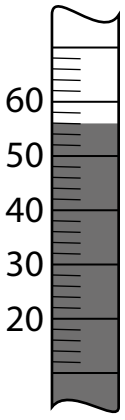
Lesson 31: Broken line graphs

Mental maths

Question		Answer	Question		Answer
Round off to the nearest one			**Round off to the nearest one**		
1	6,4		**6**	36,3	
2	2,7		**7**	0,2	
3	43,5		**8**	99,8	
4	138,1		**9**	50,6	
5	138,7		**10**	9,5	

Link to previous lesson

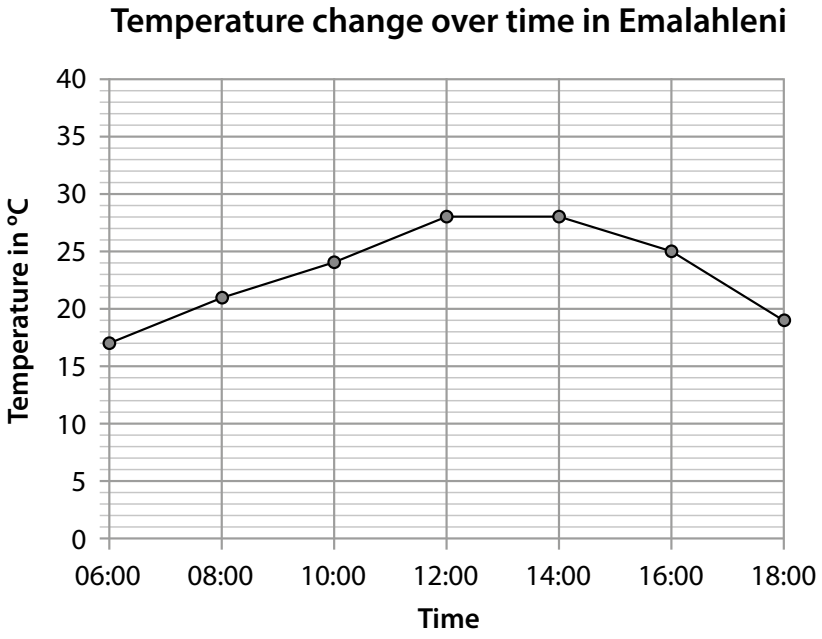
Read the temperature shown on each thermometer. Record the temperature in the space provided.

	
Temperature = _____ °C	Temperature = _____ °C

Activity 1

Work with the whole class.

Look at the broken line graph and then answer the questions.



1 What does the graph show? _____

2 Look at the temperature at 06:00.

a What was the temperature at 06:00? _____

b What was the temperature at 08:00? _____

c By how much did the temperature change between 06:00 and 08:00?

_____

d Did the temperature increase or decrease between 06:00 and 08:00?

_____

e How does the graph show that the temperature is increasing?

_____

_____

3 Look at the temperature at 12:00.

a What was the temperature at 12:00? _____

b What was the temperature at 14:00? _____

c Did the temperature increase or decrease between 14:00 and 16:00?

_____

d How does the graph show that the temperature stayed the same?

_____

_____

4 Look at the temperature at 16:00.

a What was the temperature at 16:00? _____

b What was the temperature at 18:00? _____

c Did the temperature increase or decrease between 16:00 and 18:00?

_____

d How did the graph show that the temperature decreased?

_____

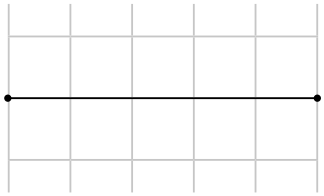
_____

5 Fill in the missing words to describe how the temperature changed during the day. Use the words: decreased, increased or stayed the same in the right places in this sentence:

The temperature _____ until 12:00, _____ between 12:00 and 14:00, and then _____ between 14:00 and 18:00.

HOMEWORK

Draw a line to match the broken line graph with the change it shows.

Description		Change
		Increasing
		Decreasing
		Constant (stays the same)

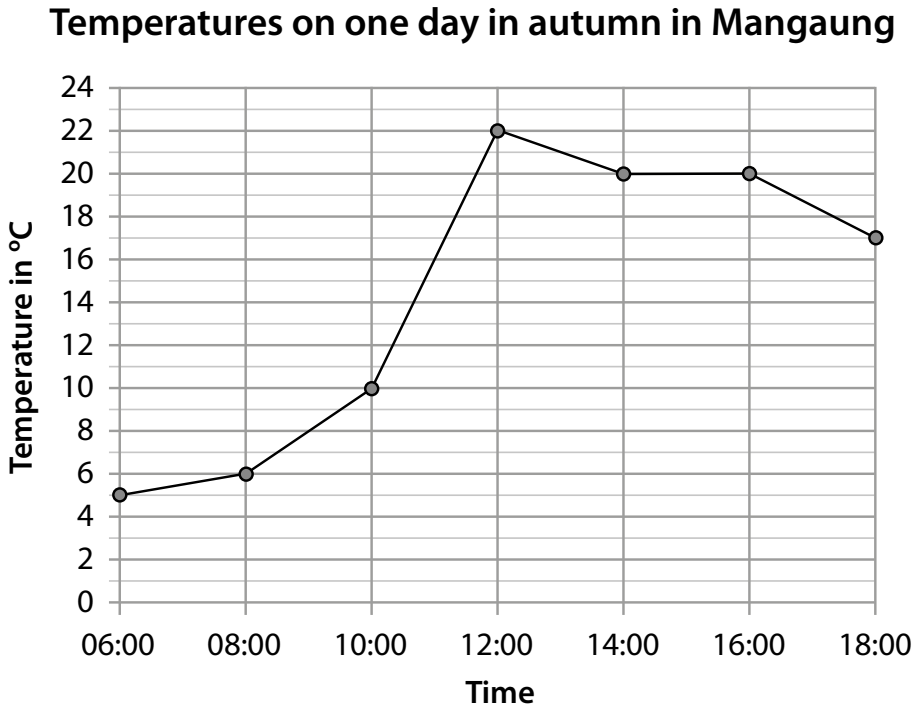
Lesson 32: Broken line graphs show change over time

Mental maths

Question		Answer	Question		Answer
Round off to one decimal place			**Round off to one decimal place**		
1	1,39		**6**	57,41	
2	2,55		**7**	164,25	
3	43,27		**8**	34,06	
4	94,92		**9**	8,04	
5	69,83		**10**	39,98	

Link to previous lesson

Look at the broken line graph and then answer the questions.



1 What was the highest temperature recorded? _____

2 At what time was the highest temperature recorded? _____

3 Draw a circle around the correct words:

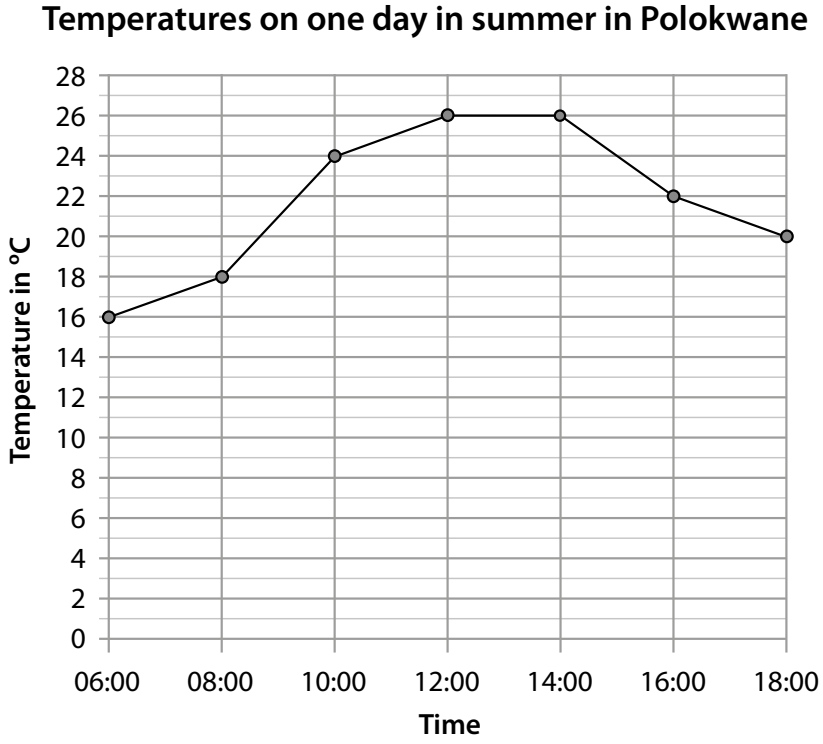
a The temperature increased / decreased / stayed the same between 10:00 and 12:00.

b The temperature increased / decreased / stayed the same between 12:00 and 14:00.

c The temperature increased / decreased / stayed the same between 14:00 and 16:00.

Activity 1

Work with your class.



1 The answer is 16 °C. What's the question? _____

_____

2 The answer is 08:00. What's the question?_____

_____

3 The answer is 16:00. What's the question?_____

_____

4 The answer is 26 °C. What's the question?_____

_____

5 The answer is decreasing. What's the question?_____

_____

6 The answer is 1 °C. What's the question?_____

_____

Activity 2

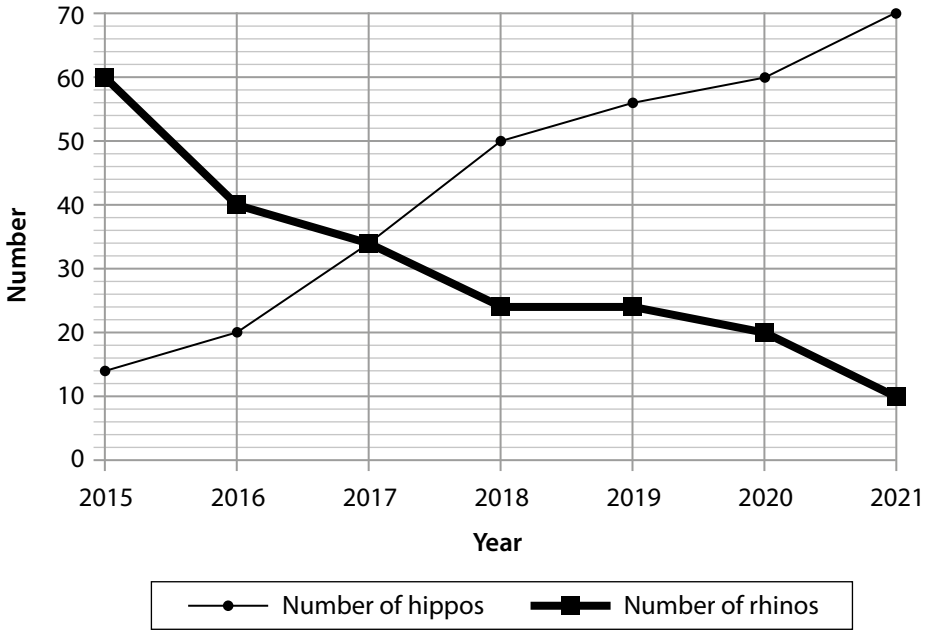
The graph shows TWO broken line graphs.

Look at the graph showing the number of rhinos and hippos in a game reserve and answer the questions about the graphs.

A rhinoceros (also called a rhino)

A hippopotamus (also called a hippo)

Number of rhinos and hippos in a Game Reserve in South Africa



1 What does the thick broken line graph represent? _____

How do you know this? _____

2 What does the thin broken line graph represent? _____

How do you know this? _____

3 What does each mark on the vertical axis represent? _____

4 How many hippos were there in the reserve in 2016? _____

5 How many more rhinos than hippos were there in 2015? _____

6 How many more hippos than rhinos were there in 2020? _____

7 In which year were there the same number of hippos and rhinos in this Game Reserve? _____

8 Describe the change in the number of hippos in the reserve between 2015 and 2021.

_____

_____

9 Describe the change in the number of rhinos in the reserve between 2015 and 2021.

_____

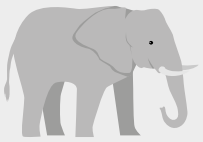
_____

10 In which year was the difference in the number of hippos and rhinos the largest? _____

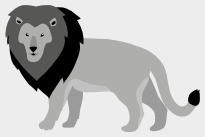
HOMEWORK

The graph shows the number of elephants and lions in a game reserve.

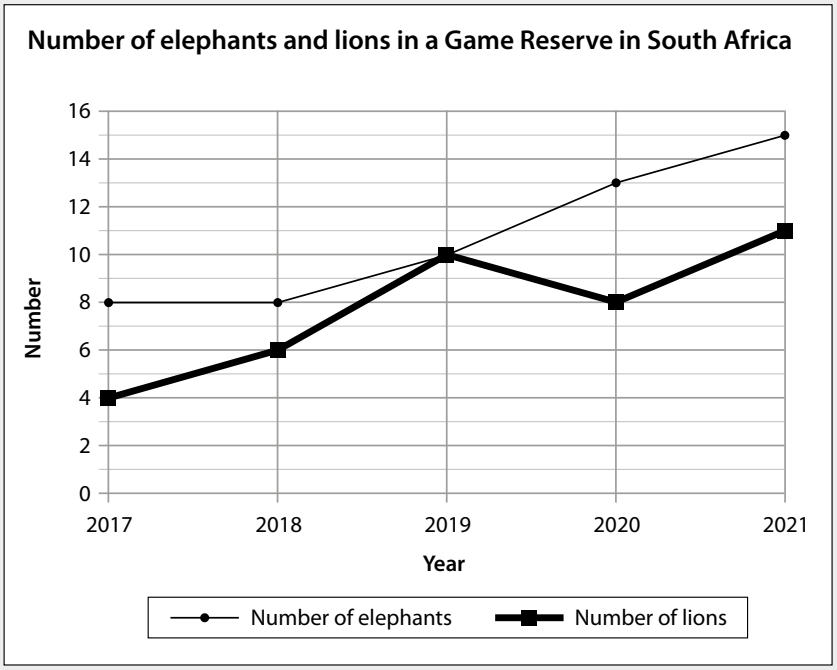
Answer the questions about the graphs.



An elephant



A lion



1. What does the thin broken line graph represent?

_____

2. What does the thick broken line graph represent?

_____

3. What does each mark on the vertical axis represent?

_____

4. How many more elephants were there in the reserve in 2021 than in 2017?

_____

5. In which year were there the same number of elephants and lions in this Game Reserve? _____

6. Describe the change in the number of lions in the reserve between 2017 and 2021.

_____

_____

_____

Lesson 33: Draw a broken line graph

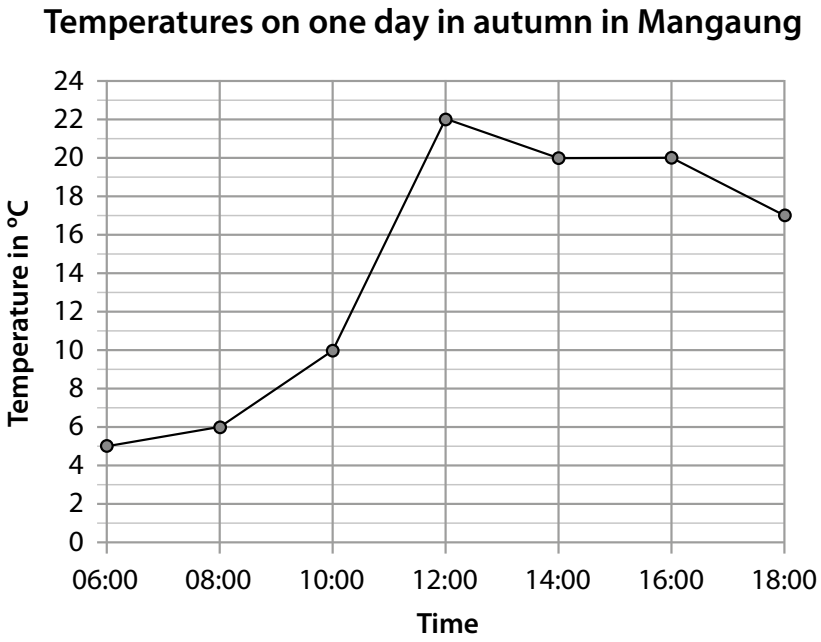
Mental maths

Question		Answer	Question		Answer
Round off to two decimal places			**Round off to two decimal places**		
1	8,624		**6**	43,809	
2	7,391		**7**	59,602	
3	0,457		**8**	24,796	
4	14,079		**9**	3,095	
5	7,413		**10**	8,998	

Link to previous lesson

- You will need three different coloured pens, pencils or crayons for drawing on the graph.

Look at the graph that you used in the previous lesson and complete the questions given below.



1 Use a coloured pen or crayon. Colour the part of the broken line graph which shows the largest increase in temperature on that day.

2 Use another coloured pen or crayon. Colour the part of the broken line graph which shows where the numbers did not change for two hours.

3 Use another coloured pen or crayon. Colour the part of the broken line graph which shows the steepest decrease in temperature.

Activity 2

Work with your teacher and on your own

Zamo lives in Bhisho. He measured and recorded the temperature every 2 hours from 06:00 to 18:00 on 28 June. The table shows the temperatures he recorded.

Temperatures on 28 June							
Time	06:00	08:00	10:00	12:00	14:00	16:00	18:00
Temperature	5 °C	7 °C	11 °C	14 °C	18 °C	15 °C	7 °C

Use the information from the table to draw a broken line graph showing the temperatures on 28 June.

STEP 1: Fill in the title the graph.

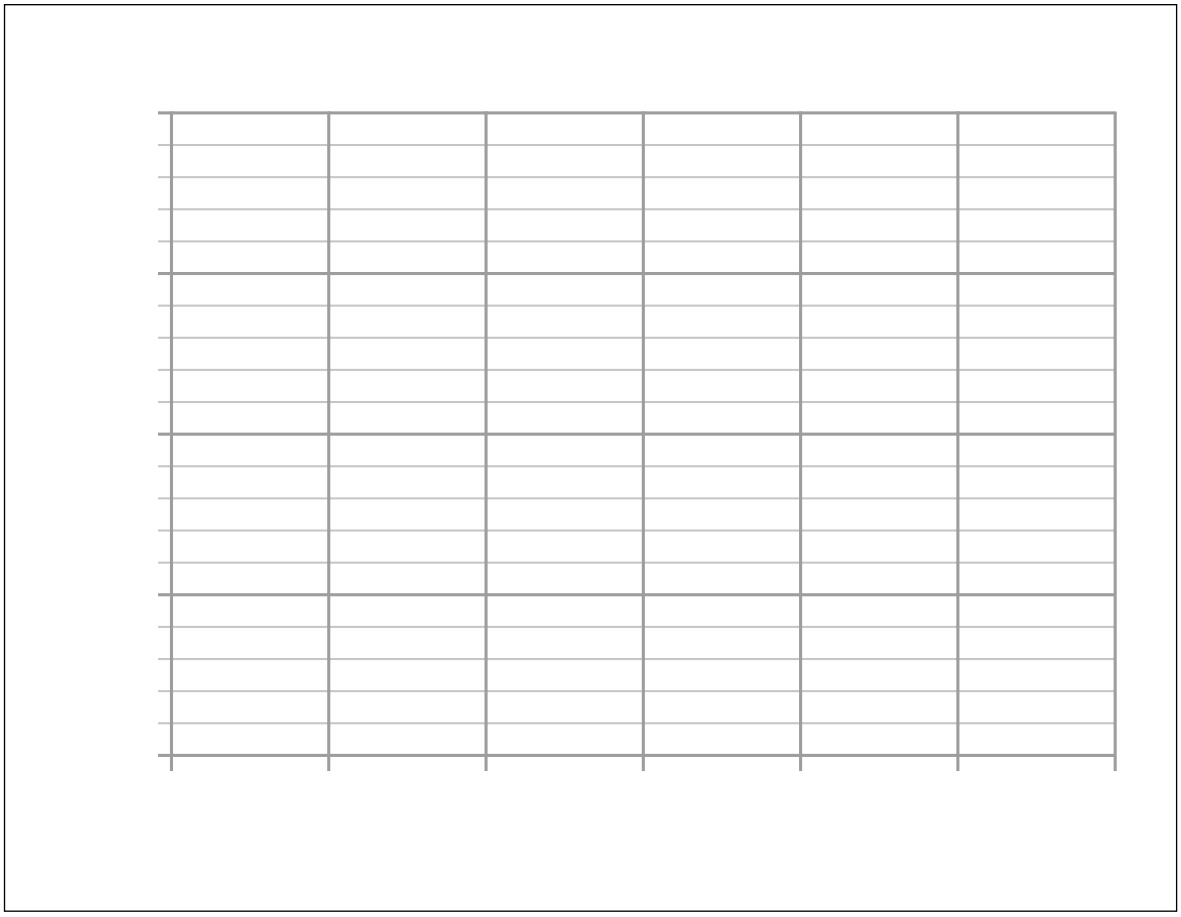
STEP 2: Fill in the label on the vertical axis and the label on the horizontal axis.

STEP 3: Look at the times in the table and fill in the times along the horizontal time axis.

STEP 4: Look at the temperatures in the table and fill in the temperatures on the vertical axis.

STEP 5: Make a dot for the temperature reading at each hour.

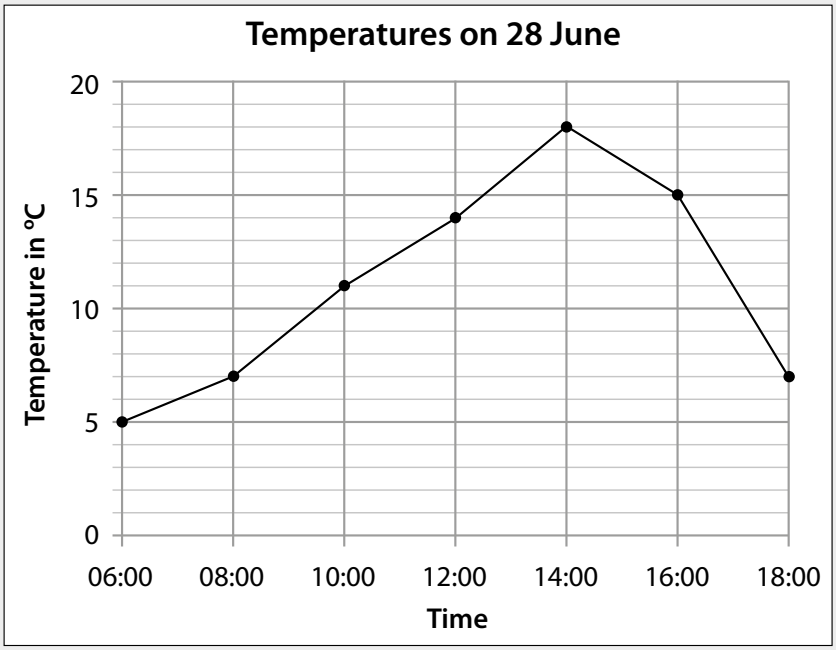
STEP 6: Use a ruler. Connect the dots in order.



You have now drawn your own broken-line graph!

HOMEWORK

Look at the broken line graph you drew in Activity 2.



1. Between which hours was the temperature increasing?

_____

2. Between which hours was the temperature decreasing?

_____

3. Between which hours did the temperature decrease the most?

_____

Lesson 34: More broken line graphs

Mental maths

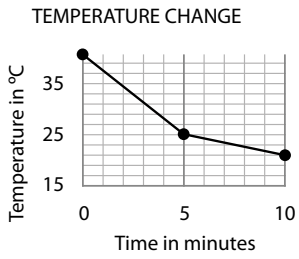
Question		Answer	Question		Answer
1	10 × 25		**6**	2 × 25	
2	4 × 25		**7**	20 × 25	
3	3 × 25		**8**	5 × 25	
4	7 × 25		**9**	9 × 25	
5	6 × 25		**10**	8 × 25	

Link to previous lesson

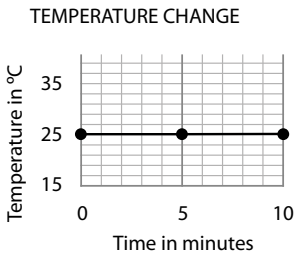
Thato heated water in a pot.

1 Which graph shows how the temperature of water changes when it is heated? (c)

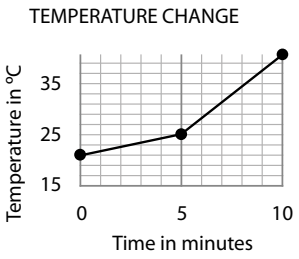
a



b



c



2 Give a reason for your answer.

_____

_____

Activity 2

Work with a partner.

Hluphe was feeling sick. Her mother measured her temperature every two hours. This is what the digital thermometers showed:

Time	Thermometer
10:00	
12:00	
14:00	
16:00	
16:00	
20:00	
22:00	

1 Read the temperatures off the thermometers and write them in this table.

Time	10:00	12:00	14:00	16:00	18:00	20:00	22:00
Temperature	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C	_____ °C

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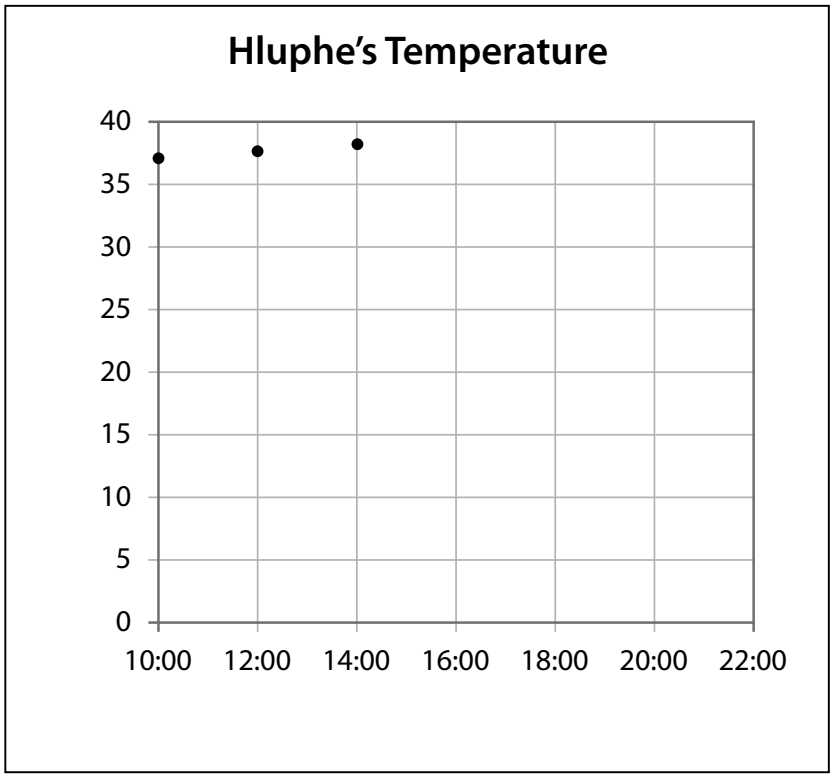
2 The first three points have been plotted for you on the line graph to show how Hluphe's temperature changed over time.



a Does this graph have a heading? _____

b What label must we add to the horizontal axis? _____

c What label must we add to the vertical axis? _____

d The first three dots showing Hluphe's temperature have been drawn for you.
Draw the rest of the dots. Use a ruler. Connect the dots in order.

3 Look at your graph:

a Describe what the graph looks like.

_____

_____

b If the graph doesn't look right, how can we change it?

_____

_____

c Was it difficult to draw the dots?

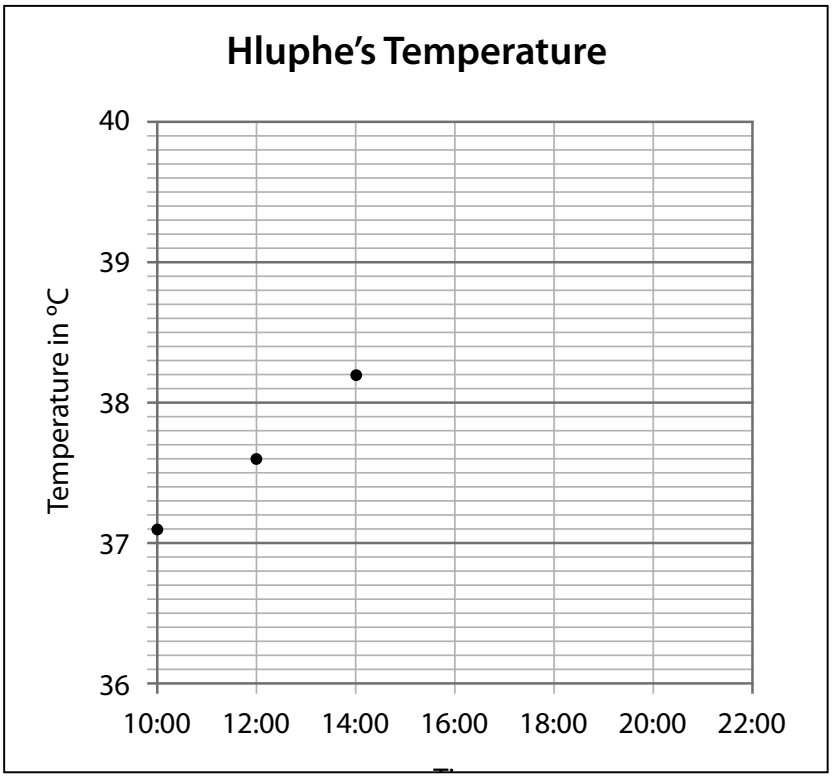
_____

_____

d Can you see the change of temperature clearly and exactly on this graph?

_____

4 Let's draw a graph showing Hluphe's temperature on another set of axes. The headings, labels, units and the first three points/temperatures have been given. Complete the graph.



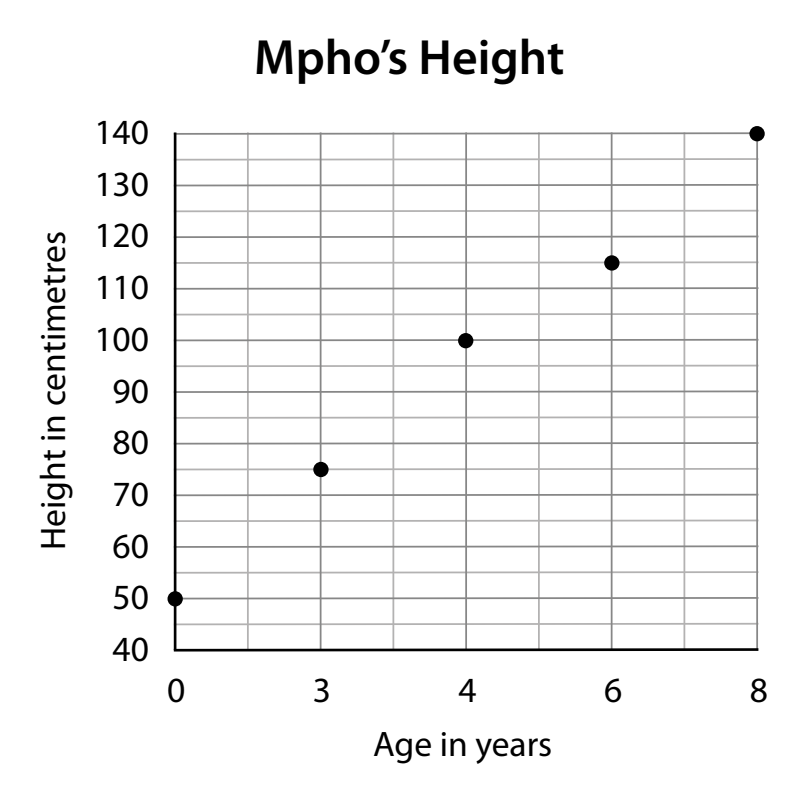
5 Write sentences describing the differences you have noticed between the two graphs.

HOMEWORK

Mpho's mother kept a record of Mpho's height.

Both the table and broken line graph show Mpho's height.

Age in years	Birth	2	4	6	8
Height in cm	50	75		115	140



1 Use the graph to fill in the missing height on the table.

2 Finish the graph by joining the points that show Mpho's height.

Lesson 35: Combined graphs

Mental maths

Question		Answer	Question		Answer
1	10 × 50		**6**	100 × 50	
2	2 × 50		**7**	200 × 50	
3	4 × 50		**8**	5 × 50	
4	6 × 50		**9**	7 × 50	
5	8 × 50		**10**	9 × 50	

Link to previous lesson

Look at the graph of Mpho's height that you drew for homework.

Answer the questions.

1. How tall was Mpho when she was 4 years old? _____

2. How old was Mpho when she was 115 cm tall? _____

3. About how tall might Mpho have been when she was 5 years old? Draw a circle around the answer.

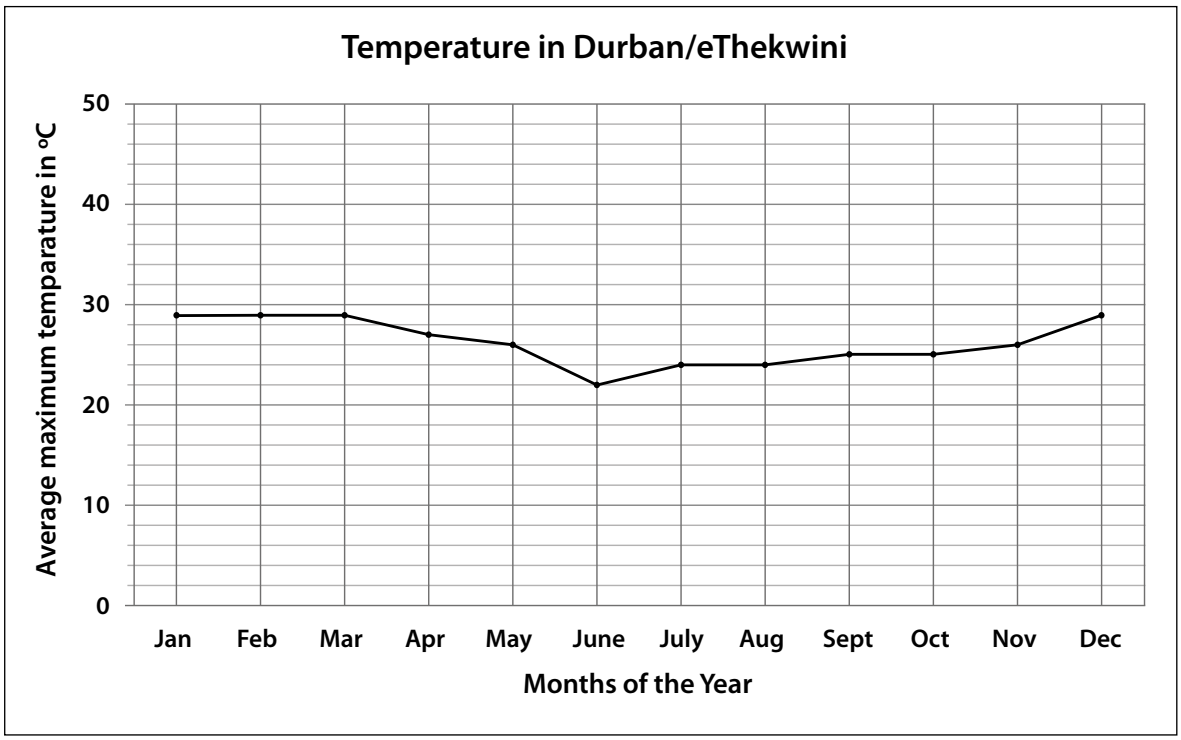
108 cm 100 cm 115 cm

Activity 1

Work with a partner

1 This graph shows the average maximum temperature in Durban/eThekwini during the year.

Answer the questions about the graph.



a During which four months was the average maximum temperature highest?

_____

b During which three months was the average maximum temperature lowest?

_____

c John says: "It is summer in Durban in June, July and August".

i Is John right or wrong? _____

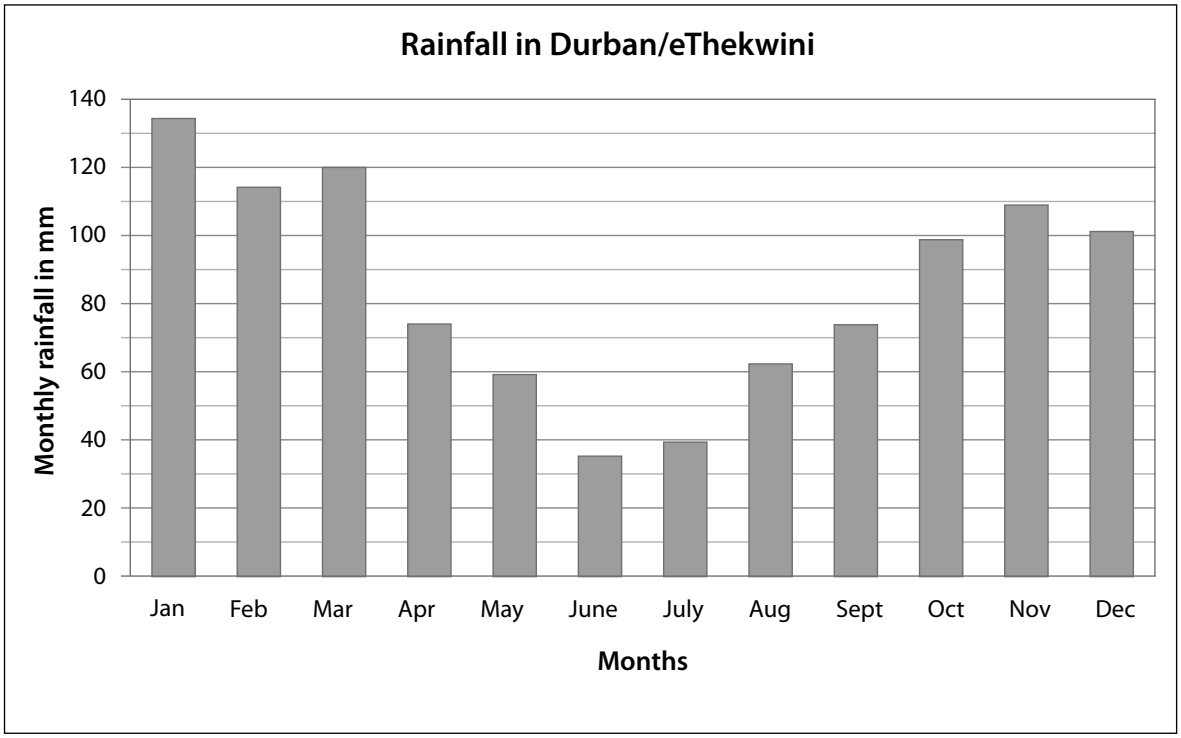
ii Give a reason for your answer.

_____

_____

_____

2 This graph shows the total rainfall each month in Durban/eThekwini. Answer the questions about the graph.



a During which month was the rainfall highest?

_____

b During which month was the rainfall lowest?

_____

c State whether true or false:

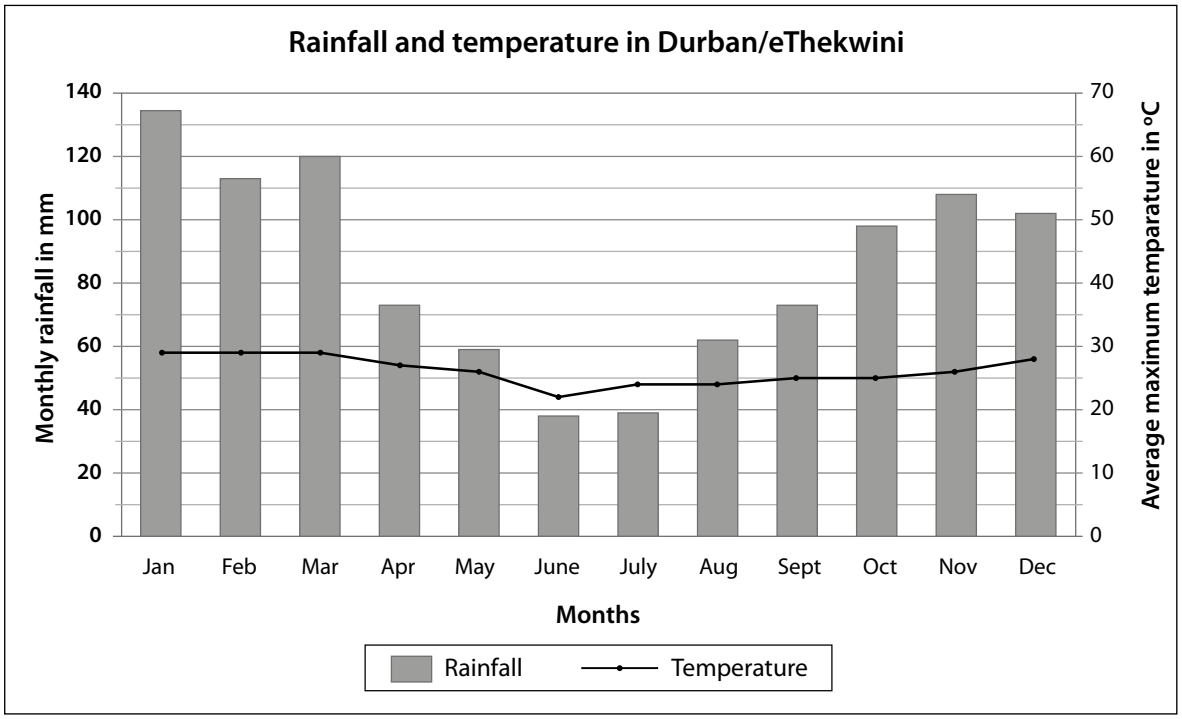
Durban receives more than 100 mm per month from November to March.

_____

Activity 2

1 Discuss this graph with your whole class.

This combined graph shows the total rainfall each month in Durban/ eThekwini, AND the average maximum temperature each month.



a Which graph shows the amount of rainfall each month?

_____

b On which axis can you read the amount of rainfall?

_____

c In which month was there the most rainfall?

_____

d In which month was there the least rainfall?

_____

e Which graph shows the temperature each month?

_____

f On which axis can you read temperature?

_____

g In which months was the temperature the highest?

_____

h Write a conclusion by drawing a circle around the correct word:

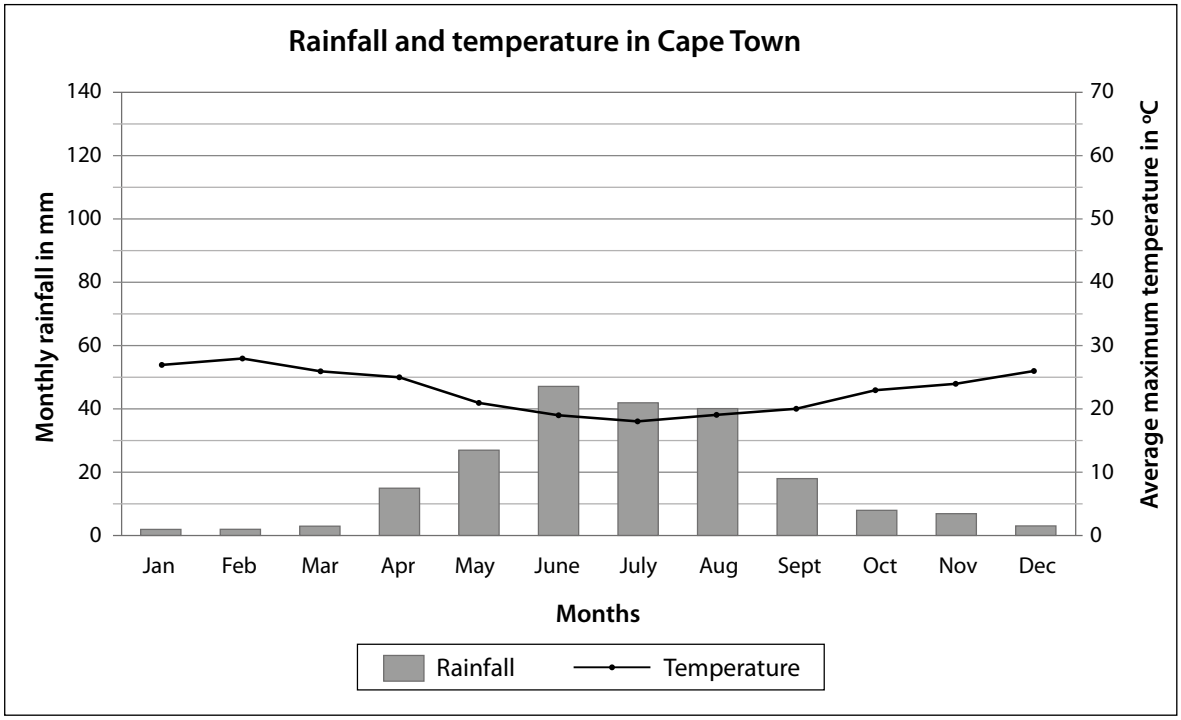
Durban has its highest temperature in winter/ summer.

Durban receives its highest rainfall in winter/ summer.

Durban is a winter/ summer rainfall area.

2 Discuss this graph with your partner.

This combined graph shows the total rainfall each month in Cape Town, AND the average maximum temperature each month.



a Which graph shows the amount of rainfall each month?

_____

b On which axis can you read the amount of rainfall?

_____

c In which three months was there the most rainfall?

_____

d In which four months was there the least rainfall?

_____

e Which graph shows the temperature each month?

_____

f On which axis can you read temperature?

_____

g In which months was the temperature the highest?

_____

h Write a conclusion by drawing a circle around the correct word:

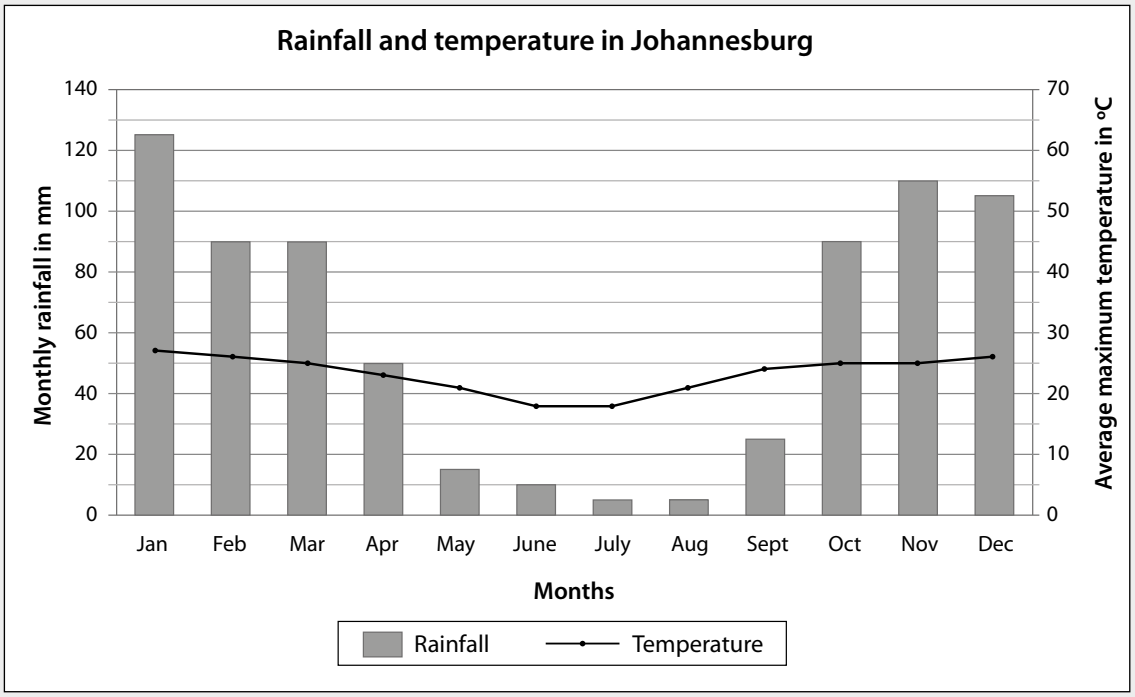
Cape Town has its highest temperature in winter/ summer.

Cape Town receives its highest rainfall in winter/ summer.

Cape Town is a winter/ summer rainfall area.

HOMEWORK

This combined graph shows the total rainfall each month in Johannesburg and the average maximum temperature each month. Use the graph to answer the questions below the graph.



1 What information is given on the bar graph?

_____

2 What information can you read on the left vertical axis?

_____

3 In which three months was there the most rainfall?

_____

4 In which two months was there the least rainfall?

_____

5 What information is given on the broken line graph?

_____

6 What information can you read on the right vertical axis?

_____

7 In which month was the temperature the highest? _____

8 Does Johannesburg lie in a winter or summer rainfall area?

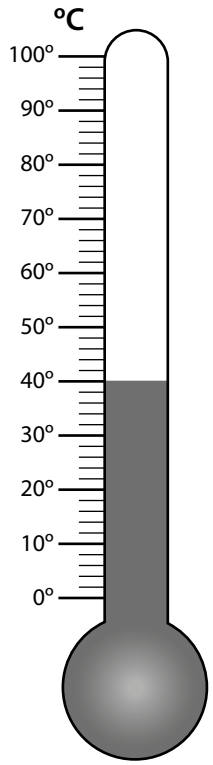
_____

Lesson 36: Consolidation

Work on these questions on your own.

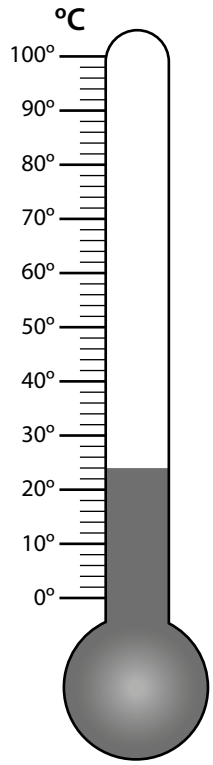
1 Write down the temperature for each thermometer.

a



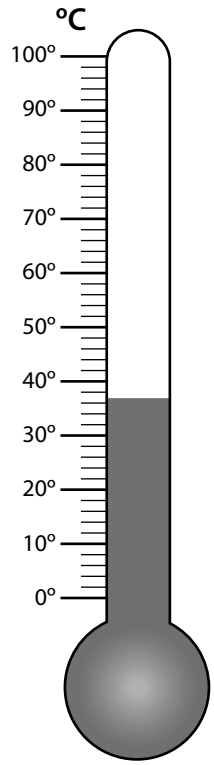
_____ °C

b



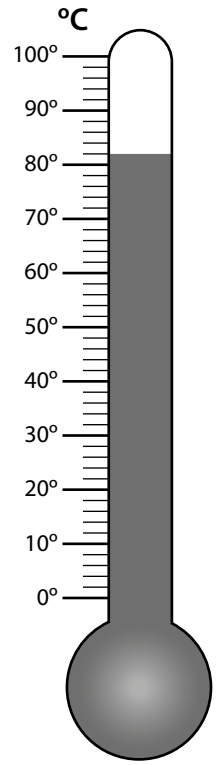
_____ °C

c



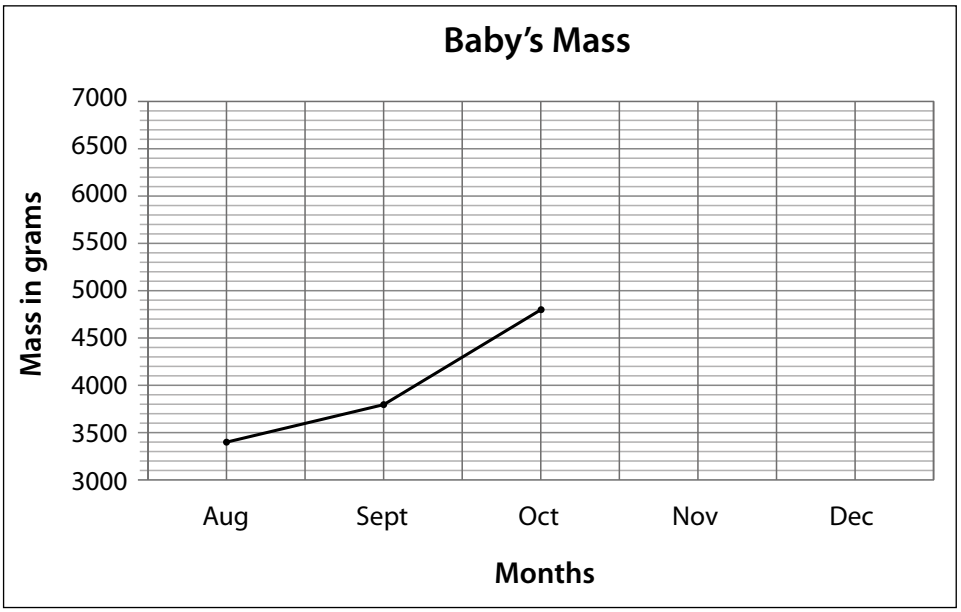
_____ °C

d



_____ °C

2 The following broken line graph and the table show how the mass of a baby changes over five months.



Month	Aug	Sept	Oct	Nov	Dec
Mass in grams	3 400	3 800		5 400	6 400

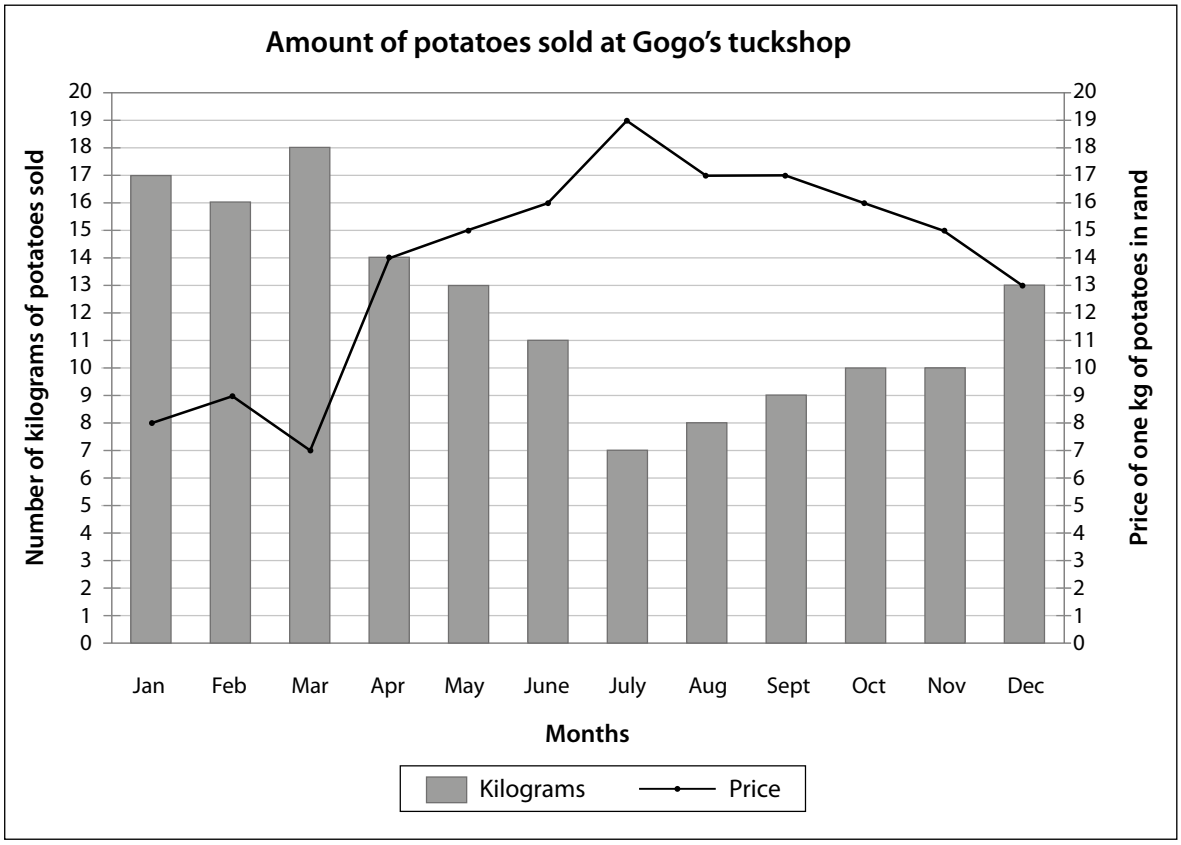
a Use the graph to fill in the missing mass on the table.

b Plot the masses for November and December on the graph and join the points.

3. The combined graph shows:

- The number of kilograms of potatoes sold at Gogo's tuckshop.
- The price of 1 kilogram of potatoes.

Study the graph and then answer the questions.



a Which graph shows the number of kilograms of potatoes Gogo sold each month?

_____

b Which graph shows the price of one kilogram of potatoes in rand?

_____

c What was the lowest price of potatoes? _____

d In which month was the price of potatoes lowest? _____

e How many kilograms of potatoes did Gogo sell in that month? _____

f In which month was the price of potatoes the highest? _____

g How many kilograms of potatoes did Gogo sell in that month? _____

h Circle the correct word in these sentences:
When the price of potatoes is low, Gogo sells more / less potatoes.
When the price of potatoes is high, Gogo sells more / less potatoes.

Lesson 37: Describe and extend geometric patterns

Mental maths

		Answer			Answer
1	5 + 4 – 3 =		**6**	2 + 5 – 5 =	
2	7 – 2 + 4 =		**7**	9 – 6 + 4 =	
3	9 – 3 + 1 =		**8**	1 + 0 – 1 =	
4	0 + 4 –2 =		**9**	4 – 1 + 3 =	
5	2 – 0 + 2 =		**10**	5 + 4 – 3 =	

Activity 1

Work with your partner

1 The Stage 1 geometric pattern on the poster has been made with matches.

a Build Stage 1 using matches. How many matches do you need to build Stage 1? _____

b Draw Stage 1 here:

2 Look at Stage 2.

a Build Stage 2 using matches. How many matches do you need to build Stage 2? _____

b Draw Stage 2 here:

3 Look at Stage 3.

a Build Stage 3 using matches. How many matches do you need to build Stage 3? _____

b Draw Stage 3 here:

4 Look at Stage 4.

a Build Stage 4 using matches. How many matches do you need to build Stage 4? _____

b Draw Stage 4 here:

5 Look at Stage 5.

a Build Stage 5 using matches. How many matches do you need to build Stage 5? _____

b Draw Stage 5 here:

6 Write a sentence to describe how you made this pattern.

_____

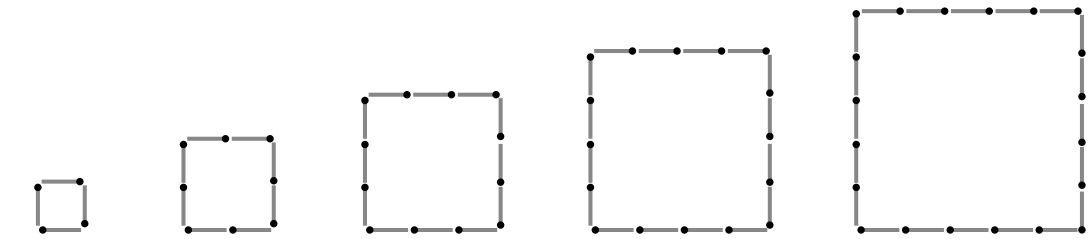
_____

_____

Activity 2

Work with a partner

Look again at this geometric pattern made with matchsticks.



Stage 1 Stage 2 Stage 3 Stage 4 Stage 5

1 Complete the table to show the number of matches used for each stage.

Stage Number	1	2	3	4	5
Number of matches used					

2 The stage number is the input number.

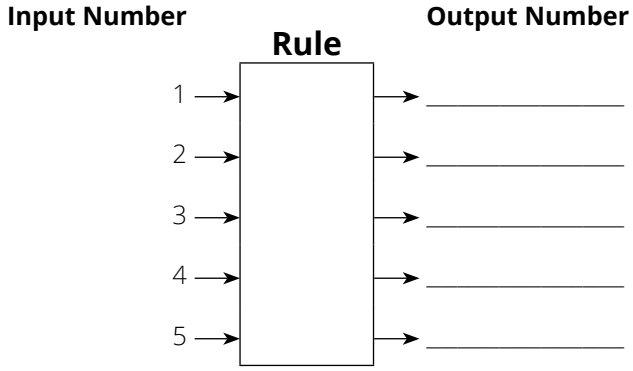
A rule can be found to find the output number which is the number of matches.

Study the table and then complete this number sentence:

Number of matchsticks = _____ × Stage number

Input number: the number that you put into a table or flow diagram to produce an output number.

3 A flow diagram was drawn to show the pattern. Fill in the rule and the output numbers on the flow diagram.



Output number: the number that is produced by using the rule on an input number in a table or flow diagram.

4 How many matches do you need for:

a Stage 6? _____

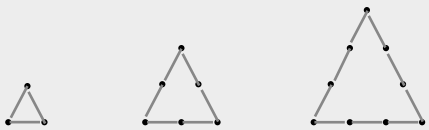
b Stage 10? _____

c Stage 12? _____

d Stage 20? _____

HOMEWORK

Look at another geometric pattern made of matches.



Stage 1 Stage 2 Stage 3 Stage 4 Stage 5

1 Draw Stage 4 and Stage 5 in the spaces provided

2 How many matches did you add:

a To Stage 1 to get Stage 2? _____

b To Stage 2 to get Stage 3? _____

c To Stage 3 to get Stage 4? _____

d To Shape 4 to get Stage 5? _____

3 Count the number of matches used for each stage and write the answers in the table.

Stage number	1	2	3	4	5
Number of matches					

4 How many matches would you need for:

a Stage 6? _____

b Stage 10? _____

c Stage 20? _____

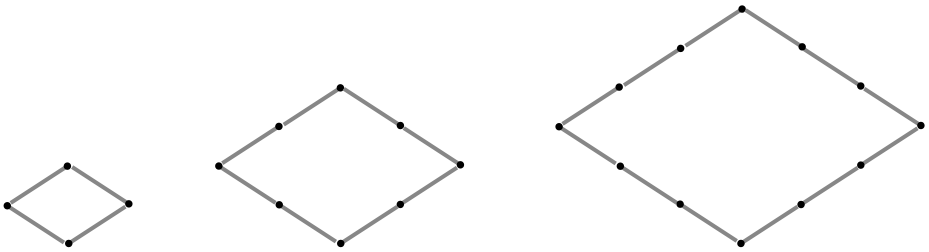
Lesson 38: More geometric patterns

Mental maths

		Answer			Answer
1	2 + 1 × 2 =		**6**	4 + 1 × 5 =	
2	3 + 4 × 1 =		**7**	3 × 6 + 2 =	
3	3 × 2 + 4 =		**8**	0 + 1 × 8 =	
4	1 + 2 × 3 =		**9**	6 + 3 × 5 =	
5	2 × 3 + 2 =		**10**	4 + 2 × 9 =	

Link to previous lesson

Look at the geometric pattern made of matches.



Stage 1 Stage 2 Stage 3

1 Complete the table to show the number of matches used for Stage 1, Stage 2, and Stage 3.

Stage number	1	2	3
Number of matches			

2 If we know the **input number** (or stage number), and the **output number** (or number of matches), we can find the **rule**.

Complete the rule: Number of matches = _____ × Stage number

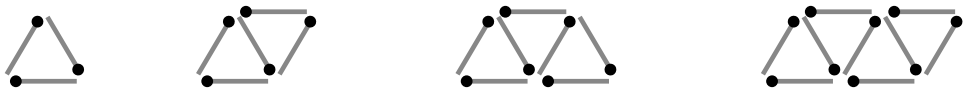
3 Find the number of matches in

a Stage 5. _____ **b** Stage 10. _____

Activity 1

Work with your partner

Look at the following pattern made of matches.



Shape 1 Shape 2 Shape 3 Shape 4

1 Use matches to build Shape 1, 2, 3 and 4 of this geometric pattern:

2 How many matches did you add:

a to Shape 1 to get Shape 2? _____

b to Shape 2 to get Shape 3? _____

c to Shape 3 to get Shape 4? _____

3 Count the number of matches in Shape 1, Shape 2 and Shape 3 and write the answer in the table.

Shape number	1	2	3	4
Number of matches				

4 If we know the input number (or shape number), and the output number (or number of matches), we can find the rule.

a We can work out the rule for this geometric pattern as follows:
Number of matches in Shape 1 = 2 matches + 1 match = 3 matches
Number of matches in Shape 2 = 4 matches + 1 match = 5 matches

Fill in the answers for Shape 3 and Shape 4:

Number of matches in Shape 3 = _____ matches + 1 match = _____ matches

Number of matches in Shape 4 = _____ matches + 1 match = _____ matches

b We can also write this:

Number of matches in Shape 1 = 1 × ____ matches + 1 match = 3 matches

Number of matches in Shape 2 = 2 × ____ matches + 1 match = 5 matches

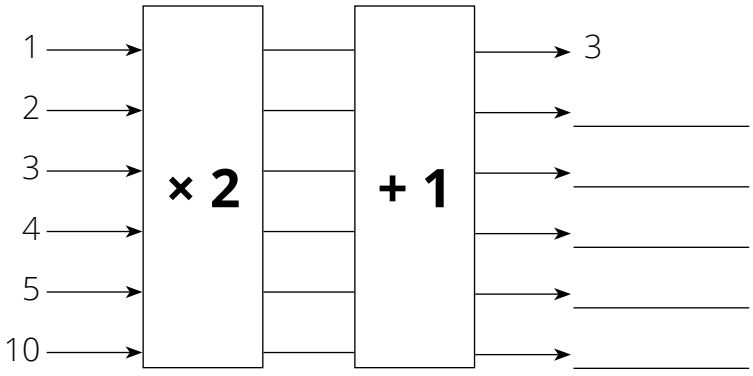
Number of matches in Shape 3 = _____ matches + 1 match = 7 matches

Number of matches in Shape 4 = _____ matches + (1) match = 9 matches

Complete:
Number of matches in any shape = number of the shape × ____ + ____

c We can draw a flow diagram like this.

Complete the flow diagram by filling in the missing output numbers.



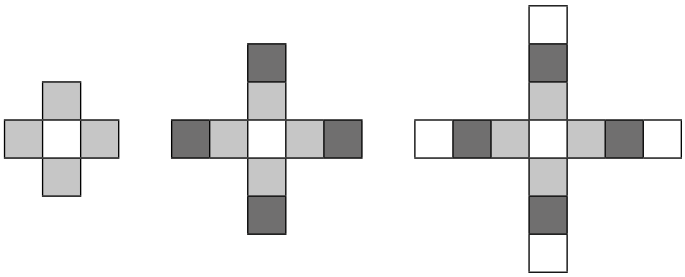
Input numbers
(Shape number)

Output numbers
(Number of matches)

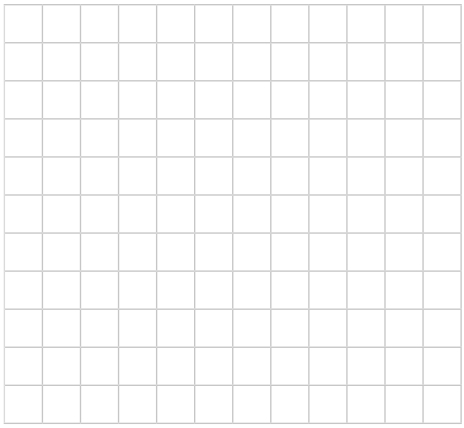
Activity 2

Work with a partner

This geometric pattern is drawn on squared paper.



Stage 1 Stage 2 Stage 3



Stage 4

1 Draw Stage 4 on the squared paper.

2 How many squares did you add:

a To Stage 1 to get Stage 2? _____

b To Stage 2 to get Stage 3? _____

c To Stage 3 to get Stage 4? _____

3 **a** Count the number of squares in Stage 1, Stage 2, Stage 3 and Stage 4 and write the answers in the table.

Stage Number	1	2	3	4	5
Number of squares	5				

b Use the table to work out the number of squares in Stage 5.

c Explain how you worked out the number of squares in Stage 5.

_____

_____

_____

4 If we know the **input number** (the stage number) and the **output number** (the number of squares), we can find the **rule**.

We can work out the rule for the geometric pattern as follows:
Number of squares in Stage 1 = 4 squares + 1 square
= 1 × 4 squares + 1 square = 5 squares
Number of squares in Stage 2 = 8 squares + 1 square
= 2 × 4 squares + 1 square = 9 squares

a Complete the following:

Number of squares in Stage 3 = 12 squares + 1 square

= _____ × 4 squares + 1 square

= _____ squares

Number of squares in Stage 4 = 16 squares + 1 square

= _____ × 4 squares + _____ square

= _____ squares

Number of squares in Stage 5 = 20 squares + 1 square

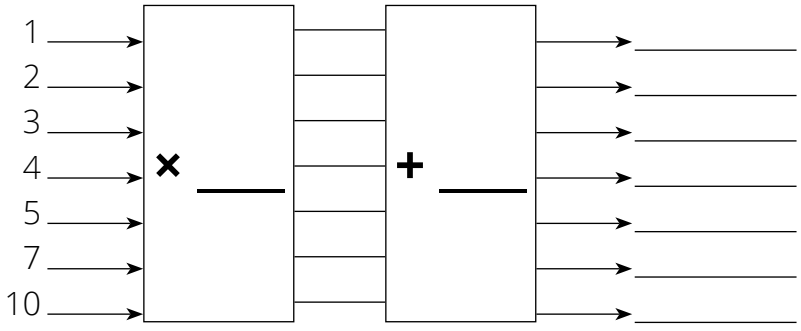
= _____ × 4 squares + _____ square

= _____ squares

b Complete this:

Number of squares in any stage = stage number × _____ + _____

5 We can draw a flow diagram like this.



Input numbers
(Stage number)

Output numbers
(Number of squares)

a Write the rule in the flow diagram.

b Fill in the output numbers.

HOMEWORK

Look at the pattern. Answer the questions.

Diagram 1 Diagram 2 Diagram 3 Diagram 4

1 Draw Diagram 4 in the space provided.

2 How many matches did you add:

a To Diagram 1 to get Diagram 2? _____

b To Diagram 2 to get Diagram 3? _____

c To Diagram 3 to get Diagram 4? _____

3 Count the number of matches in each diagram and write them in the table.

Diagram number	1	2	3	4	5	6
Number of matches						

4 Complete:

Number of matches in any diagram = diagram number × _____ + _____

Lesson 39: Consolidation

Work with your partner

1 Look at the geometric pattern made of matches.

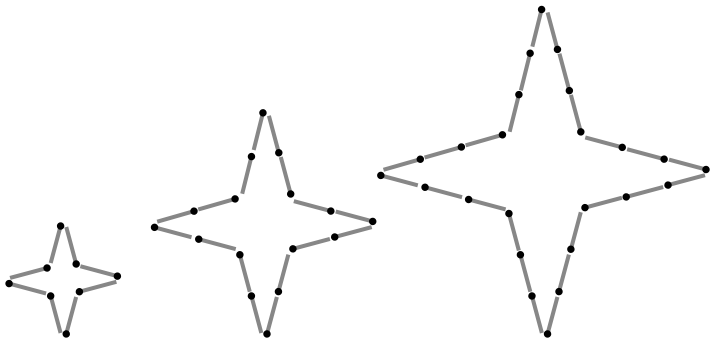


Diagram 1 Diagram 2 Diagram 3 Diagram 4

a Describe the diagrams in the geometric pattern.

_____

_____

_____

b Draw Diagram 4 in the table.

c Count the number of matches in Diagrams 1, 2, 3 and 4 and write the answers in the table.

Diagram number	1	2	3	4
Number of matches				

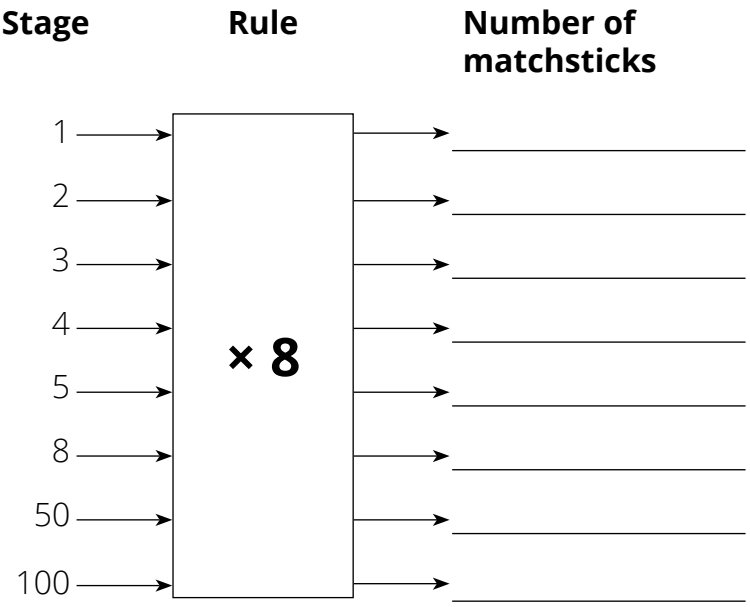
d Use the table to work out the number of matches in Diagram 5.

_____

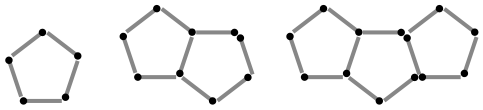
e What rule can we use to find the number of matches in each diagram?

Complete the following:
Number of matches in any diagram = diagram number _____

f Complete the flow diagram by filling in the rule and then using the rule to find the output numbers.



2 Study Stages 1, 2 and 3 of this geometric pattern made of matchsticks:



Stage 1 Stage 2 Stage 3 Stage 4 Stage 5

a Draw Stage 4 and Stage 5 in the spaces provided.

b How many matches do you add to get from:

- Stage 1 to Stage 2? _____
- Stage 2 to Stage 3? _____
- Stage 3 to Stage 4? _____
- Stage 4 to Stage 5? _____

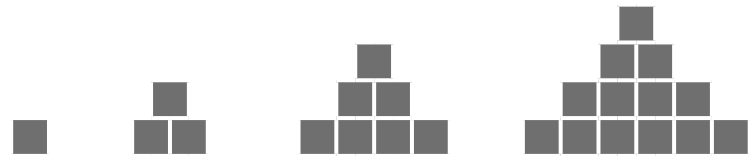
c Count the number of matches in each Stage and write the answers in the table.

Stage Number	1	2	3	4	5
Number of matches					

d Write a rule which you can use to find the number of matches in any stage:

Number of matches in any stage = stage number × _____ + _____

3 Study Stages 1, 2, 3 and 4 of this geometric pattern made of squares:



Stage 1 Stage 2 Stage 3 Stage 4 Stage 5

a Draw Stage 5 in the space provided.

b How many squares do you add to get from:

- Stage 1 to Stage 2? _____
- Stage 2 to Stage 3? _____
- Stage 3 to Stage 4? _____
- Stage 4 to Stage 5? _____

c Count the number of squares in each Stage and write the answers in the table.

Stage Number	1	2	3	4	5
Number of squares					

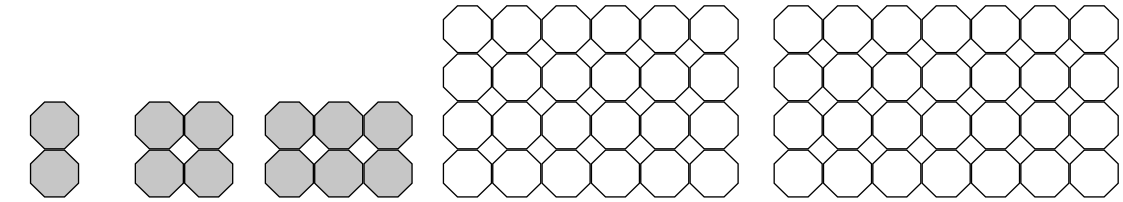
Lesson 40: Numeric patterns, flow diagrams and tables

Mental maths

		Answer			Answer
1	5 + 4 – 3 =		**6**	2 + 5 – 5 =	
2	7 – 2 + 4 =		**7**	9 – 6 + 4 =	
3	9 – 3 + 1 =		**8**	1 + 0 – 1 =	
4	0 + 4 –2 =		**9**	4 – 1 + 3 =	
5	2 – 0 + 2 =		**10**	5 + 4 – 3 =	

Link to previous lesson

Look at the geometric pattern made with octagons and squares:



Stage 1 Stage 2 Stage 3 Stage 4 Stage 5

1 Colour in octagons to show Stage 4 and Stage 5 of the geometric pattern.

2 Look at Stage 3.

a How many octagons are there in Stage 3? _____

b The octagons make squares between them.

How many squares are there in stage 3? _____

3 Complete the table for Stages 1, 2, 3, 4 and 5.
Use what you found to fill in the values for Stage 6 and Stage 7.

Stage Number	1	2	3	4	5	6	7
Number of octagons	2						
Number of squares	0	1					

4 What number pattern can you see in the number of octagons in the geometric pattern?

_____

5 What number pattern can you see in the number of squares in the geometric pattern?

_____

6 Calculate the number of octagons:

a in Stage 10 _____

b in Stage 100 _____

7 Calculate the number of squares:

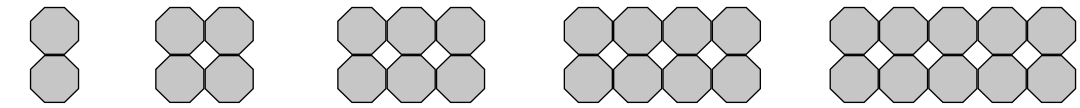
a in Stage 10 _____

b in Stage 100 _____

Activity 1

Work with a partner

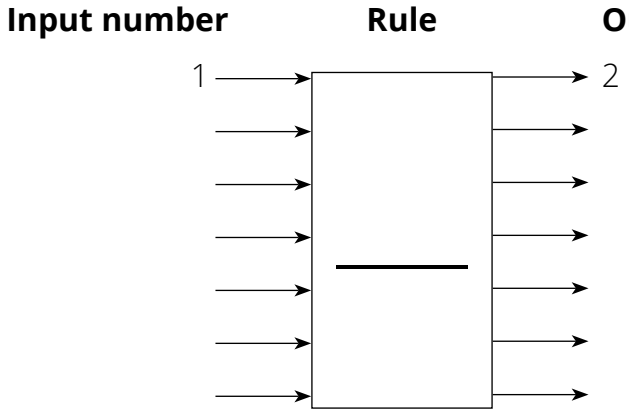
Use the geometric pattern made with octagons and squares to answer the questions.



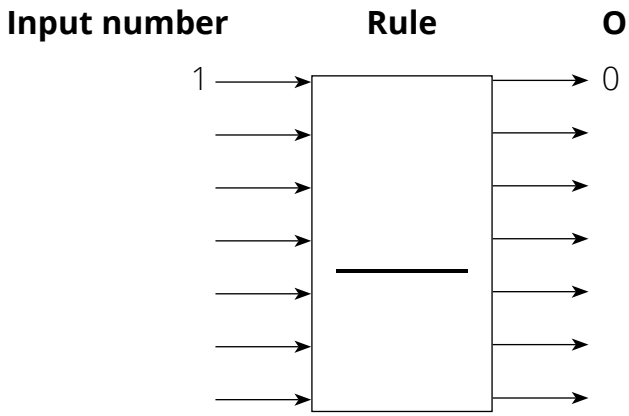
Stage 1 Stage 2 Stage 3 Stage 4 Stage 5

1 Complete each flow diagram by filling in the input numbers, rules and output numbers for the number of octagons and the number of squares.

a Flow diagram showing the number of octagons.



b Flow diagram showing the number of squares.



2 Look at the table you completed in the previous activity.

a Compare the number of octagons in row 2 of the table to the output numbers in the octagon flow diagram. What do you notice?

_____

b Compare the number of squares in row 3 of the table to the output numbers in the square flow diagram. What do you notice?

_____

3 The number sequences in the table make numeric patterns.

a The number pattern for octagons is 2; 4; 6; 8; 10…
What is the rule for moving from one number to the next in this numeric pattern?

_____

b The number pattern for squares is 0; 1; 2; 3; 4; 5…
What is the rule for moving from one number to the next in this numeric pattern?

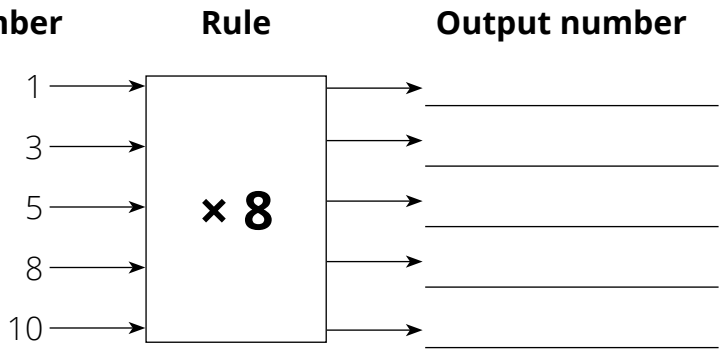
_____

Activity 2

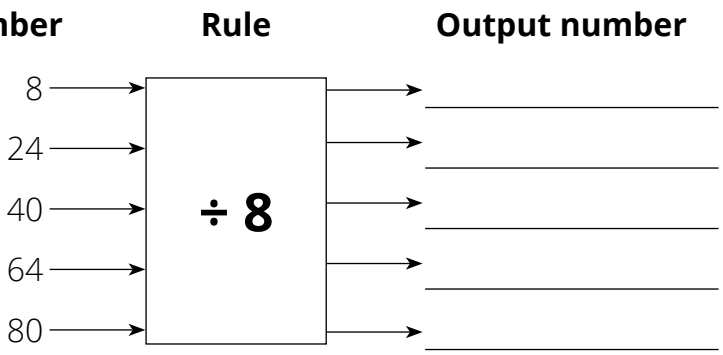
Work on your own

1 Complete the two flow diagrams.

a



b



2 Compare the input numbers in the × 8 flow diagram and the output numbers in the ÷ 8 flow diagram. What do you notice?

_____

3 Compare the output numbers in the × 8 flow diagram and the input numbers in the ÷ 8 flow diagram. What do you notice?

_____

4 Compare the rule in the first flow diagram and the rule in the second flow diagram. What do you notice?

_____

5 We can list the numbers in a flow diagram in a table.
Use the flow diagrams to complete the tables:

a

Rule: × 8					
Input number	1	3	5	8	10
Output number					

b

Rule: ÷ 8					
Input number	8	24	40	64	80
Output number					

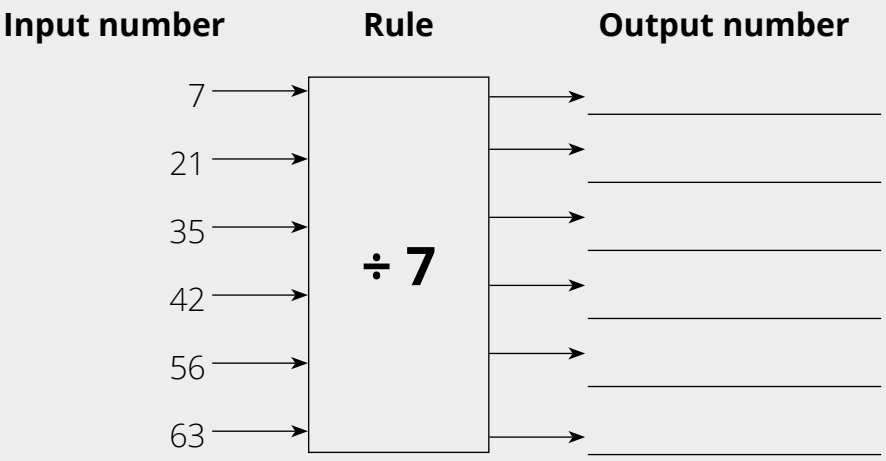
6 Complete the sentences to make them true:

a I can see that 5 × 8 = _____ and 40 ÷ 8 = _____.

b I can see that 10 _____ = 80 and 80 _____ = 10

HOMEWORK

Fill in the missing information on the flow diagram.



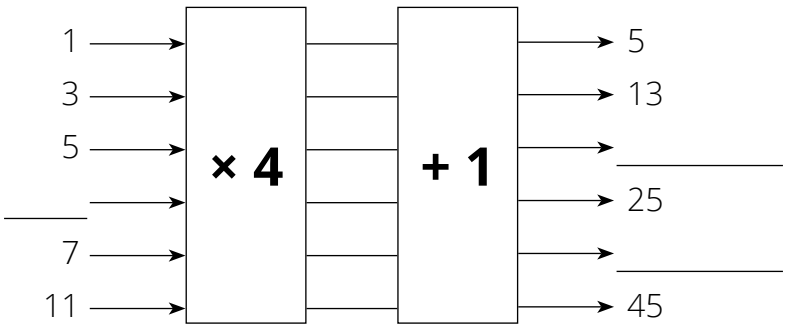
Lesson 41: Rules of operations

Mental maths

		Answer			Answer
1	4 + 2 × 1 =		**6**	5 × 3 + 5 =	
2	4 – 2 × 1 =		**7**	9 – 2 × 3 =	
3	4 × 2 + 1 =		**8**	7 + 6 × 2 =	
4	4 × 2 – 1 =		**9**	9 + 4 × 5 =	
5	6 – 3 × 2 =		**10**	8 – 4 × 2 =	

Link to previous lesson

1 Complete the flow diagram.



2 What do you notice about the rule?

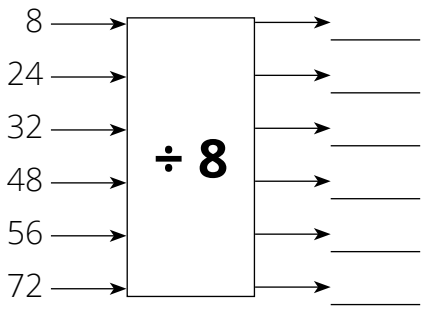
_____

Activity 1

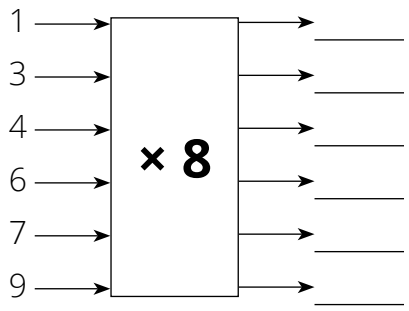
Work on your own

1 Complete the flow diagrams.

a



b



2 Can you use multiplication to check division? Give a reason for your answer.

_____

_____

3 Can you use division to check multiplication? Give a reason for your answer.

_____

_____

4 Draw one flow diagram to show all of these multiplication calculations:

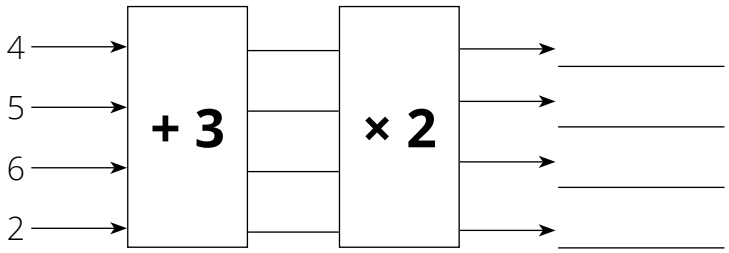
1 × 10 4 × 10 7 × 10 8 × 10 10 × 10

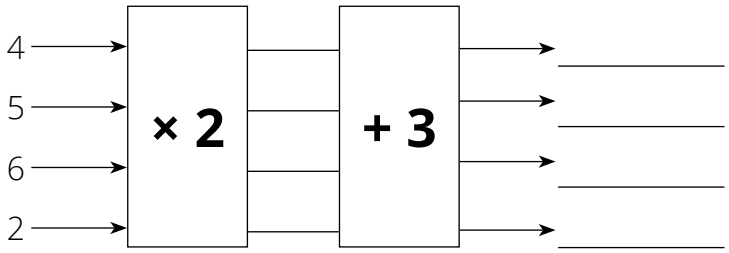
Activity 2

Work with a partner

Investigate whether the order of calculation makes a difference when multiplying and adding numbers.

1 Complete the two flow diagrams





2 In this table, write two number sentences for each input number on the two flow diagrams.

Input Number	Number sentences
4	(4 + 3) × 2 = 7 × 2 = 14 and (4 × 2) + 3 = 8 + 3 = 11
5	
6	
2	

3 Study the two flow diagrams.

a Does each flow diagram have the same input numbers? _____

b Are the output numbers the same? _____

c Give a reason for you getting your answer to b).

_____

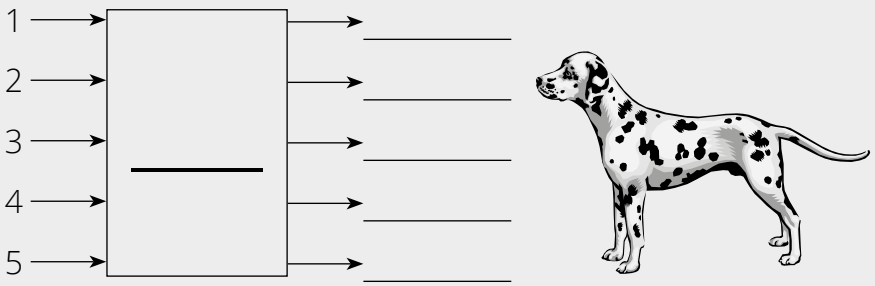
_____

HOMEWORK

One dog has 4 legs, 2 dogs have eight legs.

How many legs do 5 dogs have?

1 Complete the flow diagram and then the table to show the first 5 numbers in this numeric pattern.



Rule: × 4					
Number of dogs	1	2	3	4	5
Number of legs					

2 Write down the first 5 numbers in the numeric pattern formed by the output numbers.

_____

Lesson 42: Tables, flow diagrams and numeric patterns

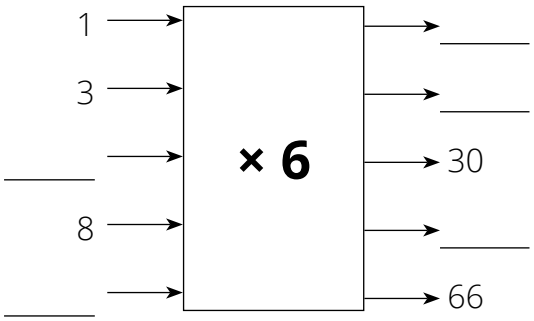
Mental maths

		Answer			Answer
1	3 + 2 × 6 =		**6**	4 × (5 – 2) =	
2	(3 + 2) × 6 =		**7**	2 × 5 + 2 =	
3	7 – 3 × 2 =		**8**	2 × (5 + 2) =	
4	(7 – 3) × 2 =		**9**	1 + 3 × 3 =	
5	4 × 5 – 2 =		**10**	(1 + 3) × 3 =	

Link to previous lesson

Work on your own and with a partner.

1 Complete the flow diagram on your own.



2 Work with your partner. Write down how you work out the missing input numbers in the flow diagram.

_____

_____

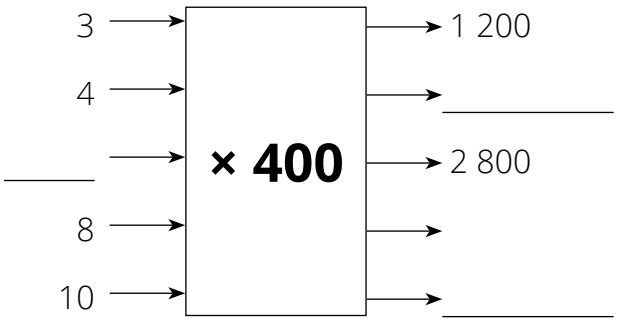
_____

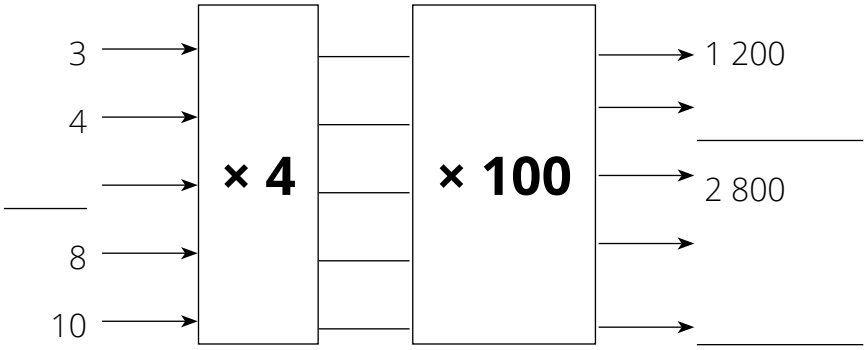
_____

Activity 1

Work with a partner

1 Complete these two flow diagrams.





2 What do you notice about the input numbers and the output numbers in each flow diagram?

_____

_____

3 The rules in the two flow diagrams are different. Describe the difference between the two.

_____

_____

4 Which is easier? Give a reason for your answer.

- To multiply 12 by 400?
- To multiply 12 first by 4, and then multiplying the answer by 100?

_____

_____

5 **a** Fill in the two-step rule on the flow diagram to show an easy way to multiply by 4 000.

b Write, in your own words, an easy way to multiply by 4 000.

_____

_____

Activity 2

Work with your whole class and with your partner.

Input number	Rule and output number
1	(1 × 3) + 2 = 5
3	
5	
7	
9	
11	

1 **a** List the input numbers given in the table.

_____

b The input numbers form a number pattern.
Describe the rule you can use to write the numbers in the number pattern.

_____

_____

2 The rule that is used to find the output numbers is:

_____ + 2 = Output number

Use the rule to calculate the rest of the output numbers in the table.

3 **a** List the output numbers you calculated in the table.

_____

b The output numbers form a numeric pattern.
Complete the sentence to describe the rule you can use to write the numbers in the numeric pattern.

_____

_____

c Write the next three numbers in the numeric pattern.

_____

HOMEWORK

Use this table to answer the questions.

Rule: (Input number + 2) × 5 = Output number						
Input number	1	2	3	4	5	6
Output number	(1 + 2) × 5 = 15	(2 + 2) × 5 = 20	(3 + 2) × 5 = 25	(4 + 2) × 5 = 30	(5 + 2) × 5 = 35	(6 + 2) × 5 = 40

1 Write the input numbers as a numeric pattern. Write the next three numbers in the numeric pattern.

_____

2 Write the output numbers in the table as a numeric pattern.

_____

3 Describe the numeric pattern formed by the output numbers.

_____

4 Write down the next three numbers in the numeric pattern formed by the output numbers.

_____

_____

_____

Lesson 43: More numeric patterns

Mental maths

		Answer			Answer
1	2 + 0 × 3 =		**6**	8 × (1 + 4) =	
2	(2 + 0) × 3 =		**7**	6 + 3 × 2 =	
3	8 – 4 × 1 =		**8**	(6 + 3) × 2 =	
4	(8 – 4) × 1 =		**9**	1 + 1 × 1 =	
5	8 × 1 + 4 =		**10**	(1 + 1) × 1 =	

Link to previous lesson

Find the rule and then write the next four numbers in each numeric pattern.

1 1; 4; 7; 10; …

Rule: _____

Next four numbers in the pattern: _____

2 301; 304; 307; …

Rule: _____

Next four numbers in the pattern: _____

3 469; 464; 459; …

Rule: _____

Next four numbers in the pattern: _____

4 187; 166; 145; …

Rule: _____

Next four numbers in the pattern: _____

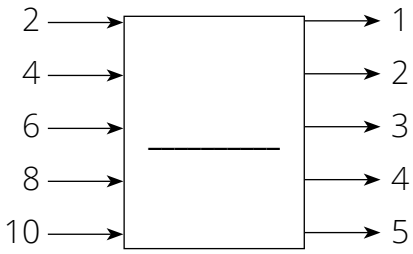
Activity 1

Work with a partner

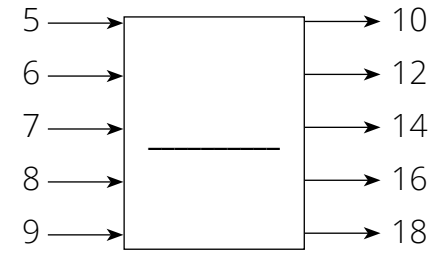
What is the rule?

Use the input numbers and the output numbers to work out the rule in each flow diagram.

1



2



Activity 2

Work on your own

1 Work out the rule. Write the next three numbers in the numeric pattern.

a. 1 600; 800; 400; ...

Rule: _____

Next three numbers in the numeric pattern: _____

b. 3; 6; 12; ...

Rule: _____

Next three numbers in the numeric pattern: _____

c. 1; 3; 9; 27; ...

Rule: _____

Next three numbers in the numeric pattern: _____

2 Consider the numeric pattern 1; 4; 9; 16; 25; ...

a Investigate the pattern by finding the difference between each number in the pattern.

4 – 1 = _____

9 – 4 = _____

16 – 9 = _____

25 – 16 = _____

b What is the rule?

_____

_____

c Write the next three numbers in the numeric pattern: _____

3 Investigate another rule for the number pattern 1; 4; 9; 16; 25; ...

a Complete the following: 1 × 1 = _____

2 × 2 = _____

3 × 3 = _____

4 × 4 = _____

5 × 5 = _____

b Give another rule: _____

c Complete the table.

Input number	1	2	3	4	5	6	7	8
Output number	1	4	9	16	25			

HOMEWORK

For each of the following, work out the rule and then write the next four numbers in the numeric pattern.

1 1; 2; 4; 8; 16; ...

Rule: _____

Next four numbers in the pattern: _____

2 512; 256; 128; 64; (32; ...

Rule: _____

Next four numbers in the pattern: _____

Lesson 44: Graphs to show a relationship

Mental maths

		Answer			Answer
1	7 – 2 × 3 =		**6**	5 × (4 + 2) =	
2	(7 – 2) × 3 =		**7**	5 × 4 – 2 =	
3	7 + 2 × 3 =		**8**	5 × (4 – 2) =	
4	(7 + 2) × 3 =		**9**	9 – 1 × 9 =	
5	5 × 4 + 2 =		**10**	(9 – 1) × 9 =	

Link to previous lesson

Look at the numeric pattern 1; 2; 4; 7; 11; 16; …

1 Complete the following:

1 + _____ = 2

2 + _____ = 4

4 + _____ = 7

7 + _____ = 11

11 + _____ = 16

2 Describe the rule that we can use to make the numeric pattern.

_____

_____

3 Continue the pattern for four more numbers.

_____

_____

_____

Activity 1

Work on your own and with the rest of the class.

These buckets can be filled with water and are very easy to use.

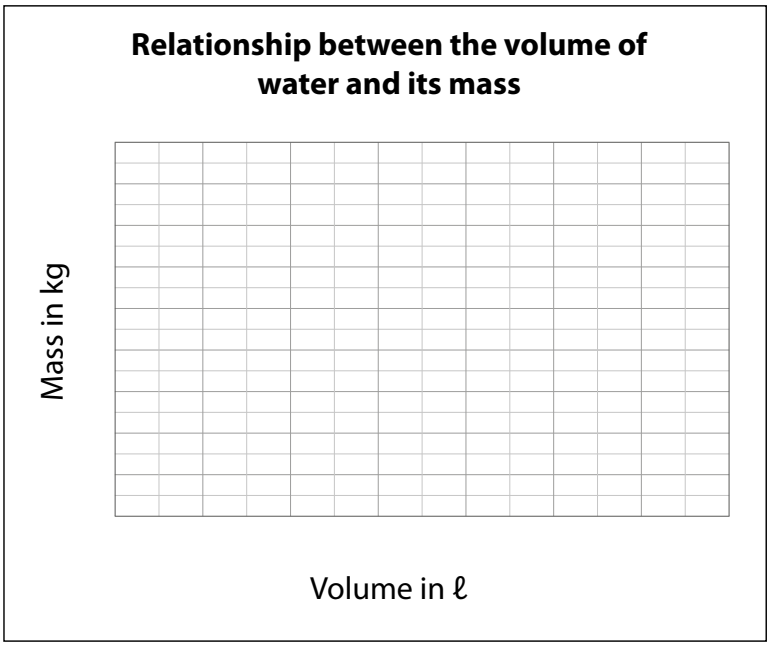
A Grade 5 class found that the mass of the bucket was 1,5 kg. They put one litre of water in the bucket and measured the mass of the water and the bucket. They then added another litre of water and measured the mass again. They recorded the information in this table.

Water volume (in ℓ)	0	1	2	3	4	5	6	7
Mass (in kg)	1,5	2,5	3,5	4,5	5,5	6,5	7,5	8,5

1 What does the information in the table tell us?

_____

2 The Grade 5 class drew a graph.



a What is the title of the graph?

_____

b On which axis do we record the volume in litres?

_____

c On which axis do we record the mass in kilograms?

_____

3 Study the table.

a What is the smallest volume? _____

b What is the biggest volume? _____

c What is the interval between the volumes? _____

4 Fill in the volume units, starting at 0 on the graph.

5 Study the table again.

a What is the smallest mass? _____

b What is the biggest mass? _____

c What is the interval between the volumes? _____

6 Fill in the mass units starting at 0 and going up in 1s on the graph.

7 **a** Find the vertical line for 1 litre. Move your finger up the line for l litre until you cross the horizontal line for 2,5 kg.

Make a dot where the 1 litre line and the 2,5 kg line cross.

b Find the vertical line for 2 litres. Move your finger up the line for 2 litres until you cross the horizontal line for 3,5 kg.

Make a dot where the 2 litre line and the 3,5 kg line cross.

c Find the vertical line for 0 litres. Move your finger up the line for 0 litres until you cross the horizontal line for 1,5 kg.

Make a dot where the 0 litre line and the 1,5 kg line cross.

d Now draw the dots for 3 ℓ, 4 ℓ, 5 ℓ, 6 ℓ and 7 ℓ.

8 Use a ruler and draw a line to join the dots in order.

9 What type of graph have you drawn?

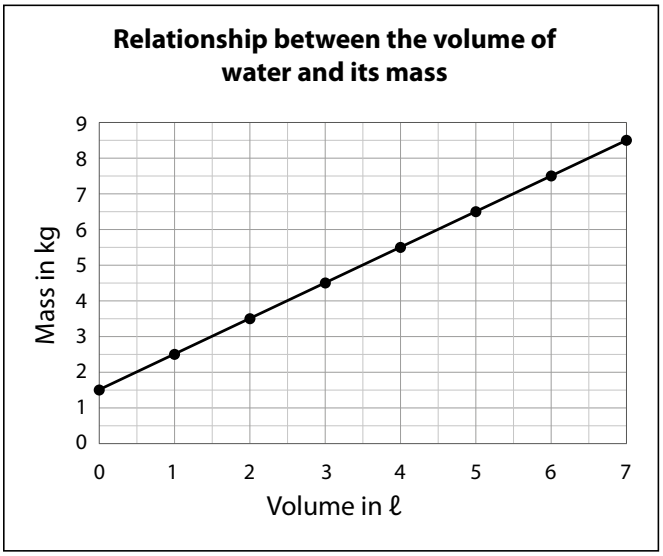
_____

Activity 2

Work with a partner

Here is the graph you drew in Activity 1.

Look at the graph and answer the questions.



1 What was the total mass, in kg, when:

a There were 4 litres of water in the bucket? _____

b There were 5 litres of water in the bucket? _____

2 What will the volume of water in the bucket be when the total mass is:

a 3,5 kg? _____

b 7,5 kg? _____

3 Now answer these:

a What will the mass be when there are 4,5 litres of water in the bucket?

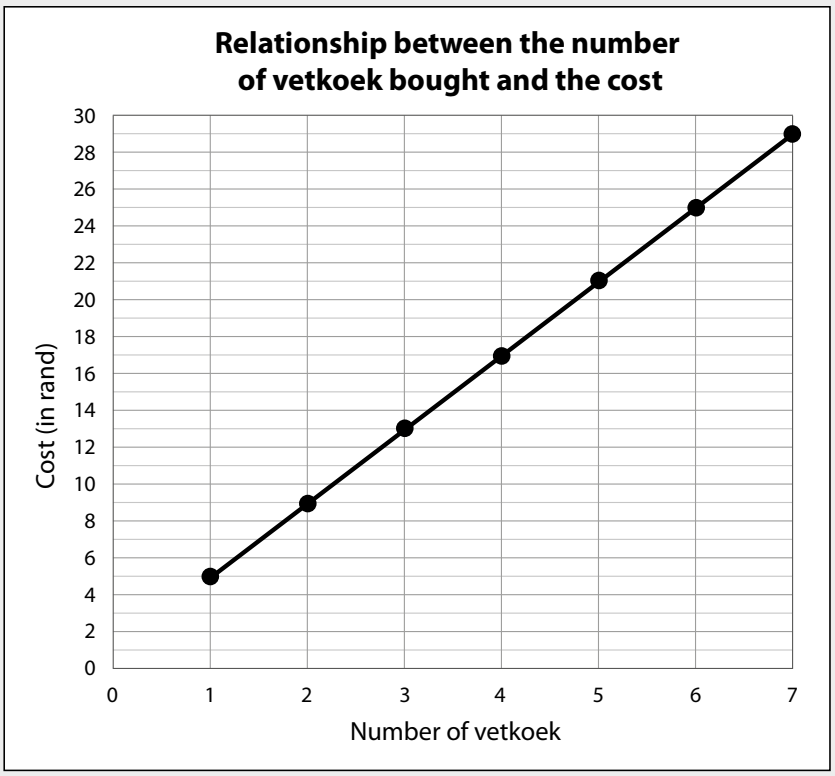
_____

b What will the volume be when the total mass is 4 kg? _____

4 What is the mass of the empty bucket? _____

HOMEWORK

Molly sells vetkoek in her spaza shop.
She drew a graph to show the cost of the vetkoek.



1 What is the cost, in rands, of:

a 10 vetkoek? _____

b 20 vetkoek? _____

c 25 vetkoek? _____

d 45 vetkoek? _____

2 Use the information given to work out the cost of 1 vetkoek.

_____

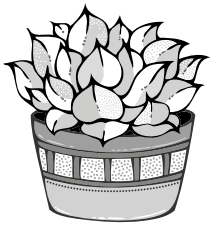
_____

Lesson 45: Graphs to show a relationship (2)

Mental maths

		Answer			Answer
1	9 – 2 × 3 =		**6**	6 × (2 – 1) =	
2	(9 – 2) × 3 =		**7**	4 + 3 – 2 =	
3	6 × 2 + 1 =		**8**	4 + (3 – 2) =	
4	6 × (2 + 1) =		**9**	8 – 2 × 3 =	
5	6 × 2 – 1 =		**10**	(8 – 2) × 3 =	

Link to previous lesson

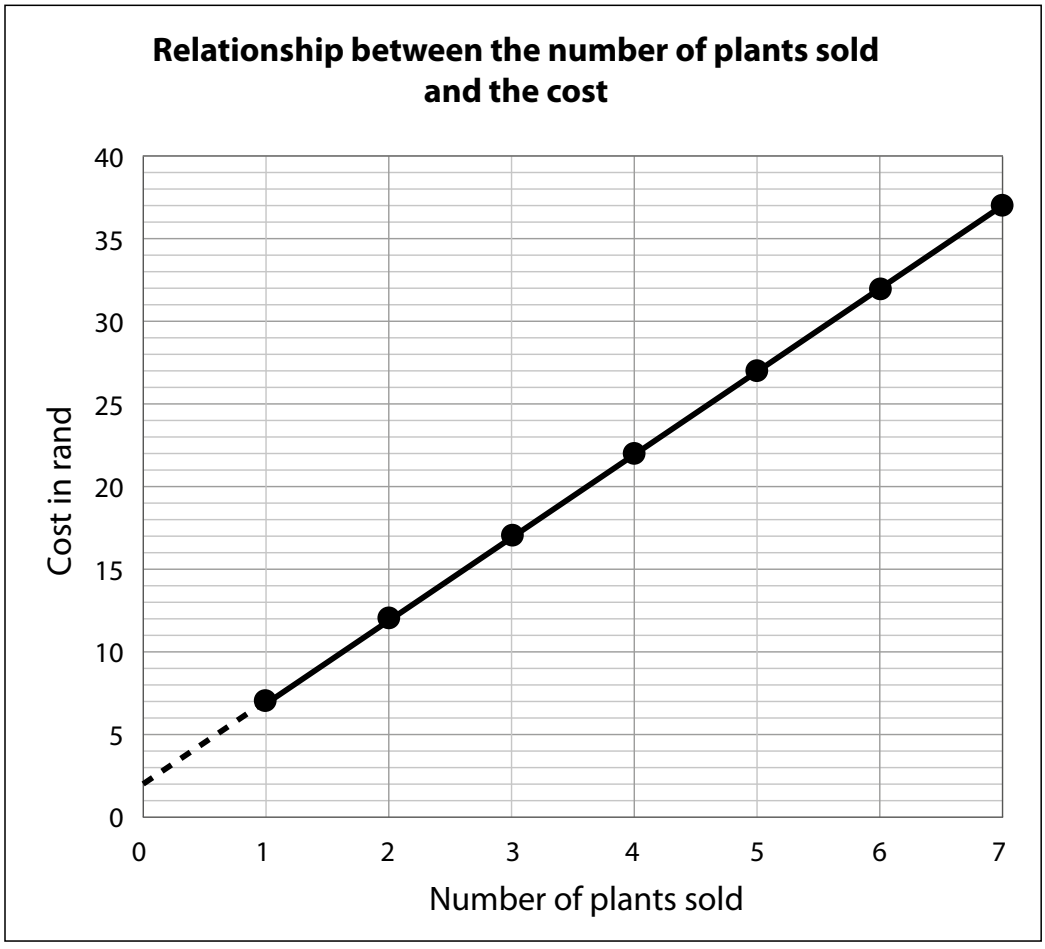


Adam sells plants in a box at the local market.

He works out the costs of the plants and boxes.

Number of plants sold	1	2	3	4	5	6	7
Cost in rand	7	12	17	22	27	32	37

He works out what he should charge.



1 What will the cost be

a of 3 plants? _____

b of 7 plants? _____

2 How many plants would you get if you paid

a R7? _____

b R27? _____

3 What is the cost of the box that Adam places the plants in?

_____

_____

_____

Activity 1

Work with a partner.

Molly sells vetkoek for R4 each. She puts all the vetkoek she sells in a packet which can hold up to 7 vetkoek. Each packet costs R1.

Molly needs to calculate how much she will earn when she sells her packets of vetkoek.

1 Let's find the rule she can use for her calculations.

a How much does a packet of 7 vetkoek cost?

Write down the calculation and the answer.

_____

b How much does a packet of 3 vetkoek cost?

Write down the calculation and the answer.

_____

c Which numbers in the calculation can change and which numbers don't change?

_____

_____

_____

d What is the rule she can use to calculate how much she can earn for her packets of vetkoek?

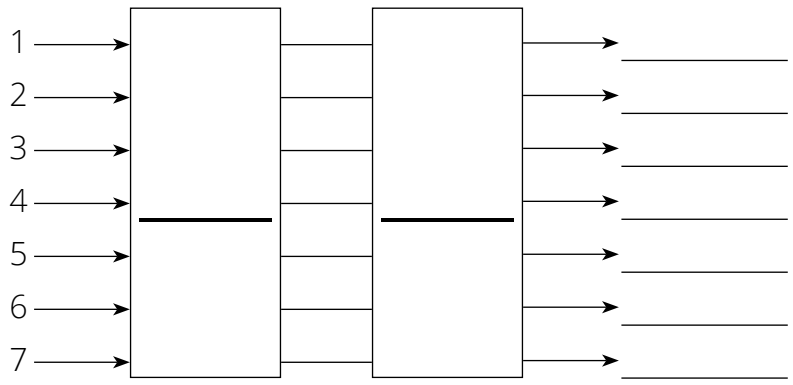
_____

2 Now you know the rule. Complete the table.

Rule: _____							
Number of vetkoek in a packet	1	2	3	4	5	6	7
Amount earned (in rand)							

3 We can also draw a flow diagram which Molly can use to work out how much she will earn.

First fill in the rule on the flow diagram and then fill in the output numbers.



Activity 2

Work on your own

1 Use the information from the flow diagram or the table in Activity 1 to draw a graph showing the relationship between the number of vetkoek in a packet and the amount of money earned in rand on the grid below.

Do this by:

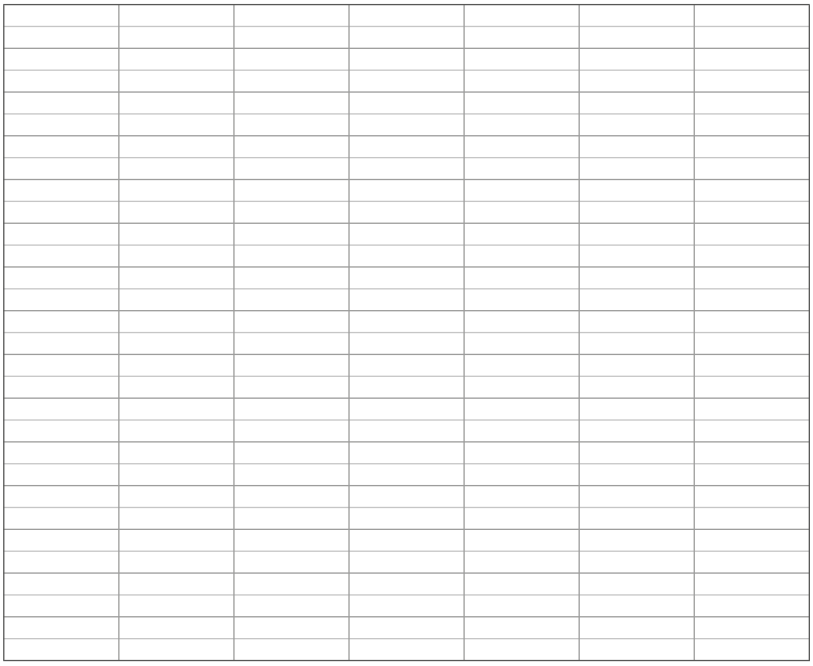
a Filling in the labels on the horizontal axis and on the vertical axis.

b Filling in the units on the horizontal axis and on the vertical axis.

c Plotting the points on the graph.

d Drawing a line to connect the dots in order.

Relationship between the number of vetkoek bought and the cost



2 Use the graph to find Molly's earnings when:

a There are 2 vetkoek in a packet? _____

b There are 5 vetkoek in a packet? _____

3 How many vetkoek will be in the packet when Molly's earnings are:

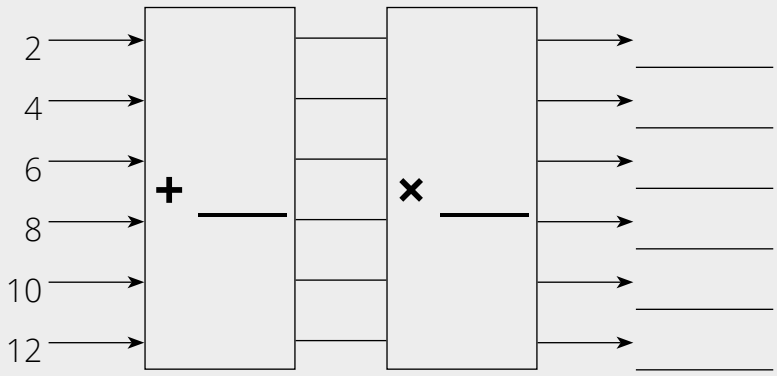
a R13? _____

b R29? _____

HOMEWORK

1 Write the rule in the flow diagram to represent the data in the table:

Input number	2	4	6	8	10	12
Output number	10	14	18	22	26	30



2 Use the rule to find the following:

a When the input number is 7, what will the output number be?

_____

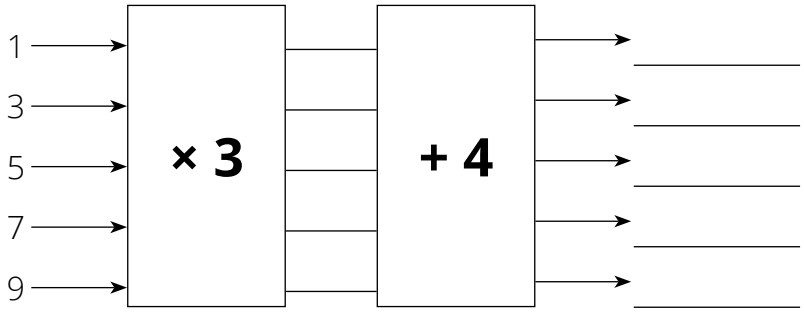
b When the output number is 36, the input number is

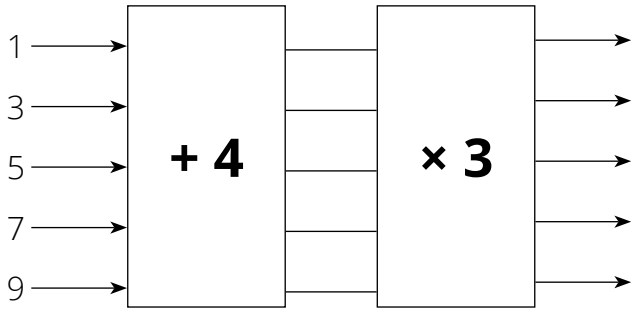
_____

Lesson 46: Consolidation

Work on your own

1 **a** Fill in the output numbers on these two flow diagrams.





b Are the output numbers the same in both flow diagrams? _____

c What do you notice about the two-step rules in the flow diagrams?

_____

_____

d If you are adding and multiplying, can you change the order? _____

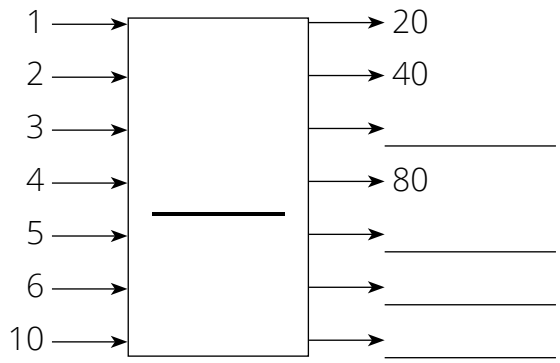
2 **a** Use the given numbers in the table to work out the rule.

_____

1	2	3	4	5	6	10
20	40					

b Use the rule to fill in the missing output numbers on the table.

c A flow diagram is drawn to represent the numbers in the table. Complete the flow diagram.



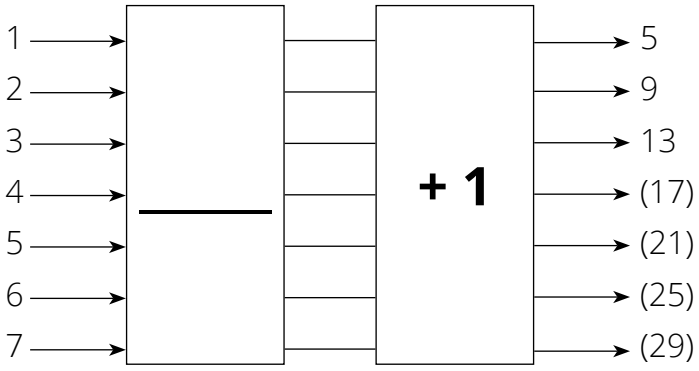
3 a Use the given numbers in the table to complete the rule:

Output number = Input number _____ + 1

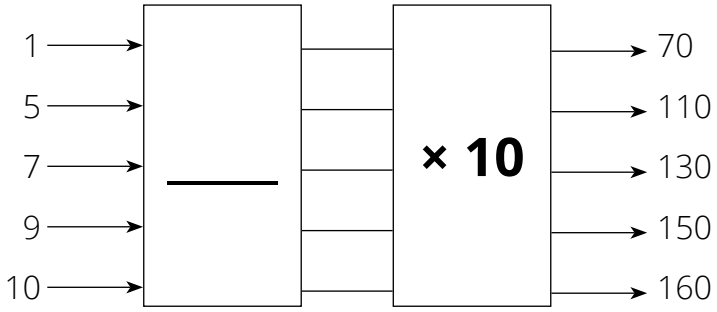
1	2	3	4	5	6	7
5	9	13				

b Use the rule to fill in the missing output numbers on the table.

c A flow diagram is drawn to represent the numbers in the table. Complete the flow diagram.



4 Fill in the missing rule on the flow diagram.



5 The bookshop sells Birthday cards in packs with different numbers of cards in each pack.

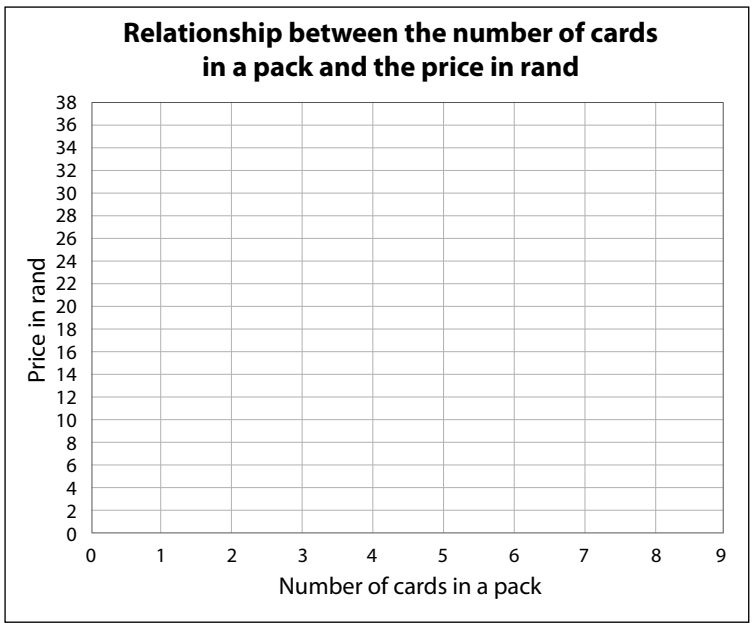
a Use the given numbers in the table to work out the rule.

_____

Number of cards in pack	2	3	4	5	6	7	8	9
Price in rand	8	12	16	20				

b Use the rule to fill in the missing output numbers in the table.

c Use the data in the table to plot the points on the graph. Then draw a line to join the dots in order.



d Extend the length of the line and work out what the price is of one birthday card.

_____