

Mathematics

Grade 3

Learner's Book

Mathematics Grade 3 Learner's Book

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How to use this book

Welcome to the *Mathematics Grade 3 Learner's Book*.

As you work through this book you will see the following features:

- At the start of each term, you will find a map. Your teacher will have some fun activities for you to do with it.
- There are **five topics per term**. Each topic is a different colour to help you find your way around.

Blue coded pages:

Numbers, operations and relationships

Take note boxes

10. Mary's favourite number is 459. Look at how she used her place value knowledge to create a poster about her favourite number.

Mary's favourite number	Broken up	Number house
459 = Four hundred and fifty nine	459 = 4 hundreds + 5 tens + 9 units	

The digit 4 in 459 represents 400.
The digit 5 in 459 represents 50.
The digit 9 in 459 represents 9.

Visual presentation

Take note
10 more than 459 is 469
100 more than 459 is 559
10 fewer than 459 is 449
100 fewer than 459 is 359

Addition and subtraction
We can add and subtract three-digit numbers using different methods. One method is to break the number down into smaller parts to make calculations easier. Study the different methods we can use to add and to subtract.

Example
Calculate $325 + 83$.

Answer

Method 1
Add by breaking down one number.
Answer
 $325 + 83 = \square$
 $= 325 + 80 + 3$
 $= (325 + 80) + 3$
 $= 405 + 3$
 $= 408$

Method 2
Add by breaking down both numbers.
Answer
 $325 + 83 = \square$
 $= (300 + 20 + 5) + (80 + 3)$
 $= 300 + (20 + 80) + (5 + 3)$
 $= 300 + 100 + 8$
 $= (300 + 100) + 8$
 $= 400 + 8$
 $= 408$

Two-dimensional shapes
A two-dimensional shape has a flat surface like a piece of paper.

Circle	Square	Triangle	Rectangle
A circle is a shape that is round.	A square has four straight sides of the same length.	A triangle has three straight sides.	A rectangle has four straight sides. The opposite sides are equal in length.

Example
Name the shapes, and write their names.

Answer
A – Square B – Triangle C – Rectangle D – Circle

Example
Look at the two groups. How were they sorted?

Answer
Group A: All orange, all squares with four equal straight sides.
Group B: All blue, with different shapes.

Purple coded pages:

Space and shape

Example and answer boxes

Take note

You may not work through one topic at a time, and your teacher could decide that you will do work from another topic on a particular day.

Green coded pages: Data handling

Data cycle and the tally table

After we collected data we need to organise the data and then represent it. When we collect data, we use a tally table to record it.

We can use tallies to organise the data into categories.

How to organise data in a tally table:

- We draw a single line for each item. This line is called a tally mark.
- We group tally marks in groups of five. This makes it easy to count the tally marks.
- The frequency is the total number of tally marks.

Example

Look at the tally table.

Number of three-dimensional objects	Tally marks	Frequency
		3
		5
		8

Example

Look at the three-dimensional objects and use a tally table to organise the data into rectangular prisms (boxes) and spheres (balls).

Answer

Three-dimensional objects	Tallies	Frequency
Rectangular prisms (boxes)		8
Spheres (balls)		7

Activity 20

1. Look at the objects and complete the tally table to organise the data.

Area

These are tiles. We use tiles to cover surfaces.

Example

To cover the surface below we need 18 tiles.

Another way of saying we need 18 tiles to cover the surface, is to say that the area of the surface is 18 tiles.

Activity 19

1. What is the area of these shapes? Give your answer in tiles.

a)

b)

2. What is the area of these shapes? Give your answer in blocks.

a)

Yellow coded pages: Measurement

Term

Red coded pages: Patterns, functions and Algebra

Activities

Learn about patterns

Geometric patterns

A pattern is the same thing repeated over and over again.

This is a two colour pattern.

We label it A B A B A B

This is a three colour pattern.

We label it A B C A B C

For each pattern, we first identify the first unit, then we label each one with letters of the alphabet.

Activity 12

1. Extend each pattern by drawing the next shapes.

a)

b)

c)

We can also use shapes to make different patterns. Look at the example below.

Example

a) Copy and extend the pattern with two more groups.

b) Describe the pattern.

Answer

a)

b) The pattern consists of three squares. One square is blue, and two squares are yellow.

2. Look at each pattern.

a) Copy and extend the pattern with two more groups.

b) Describe each pattern.

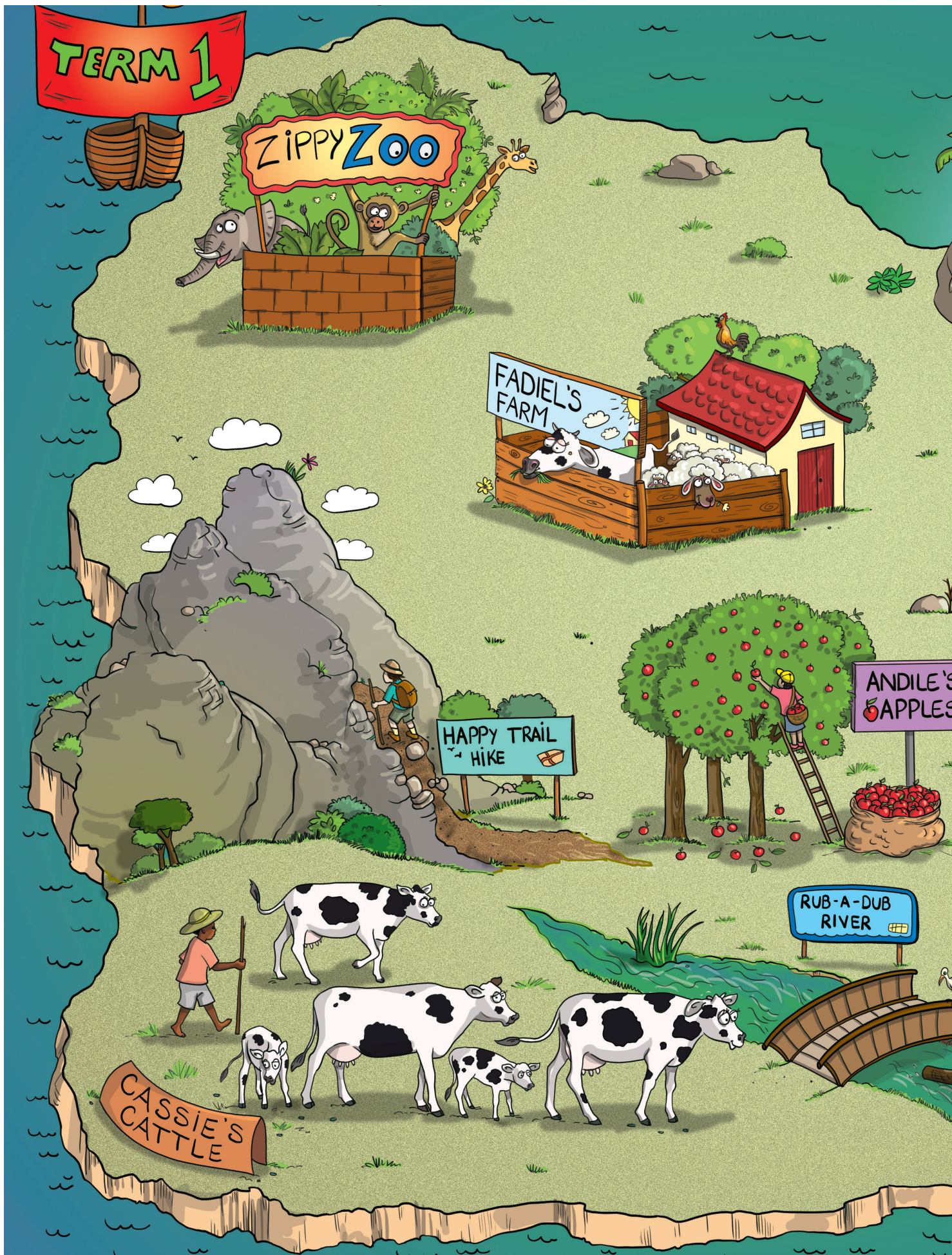
i)

ii)

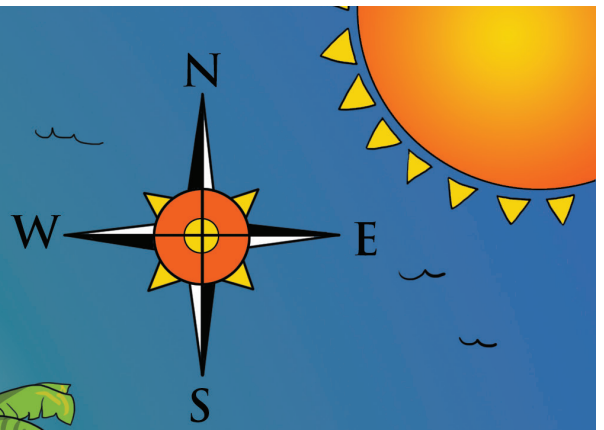
iii)

- New words and terms** have been highlighted in different colours. This indicates an important word or words that you need to know and understand. If you are unsure of what something means, ask your teacher to explain it to you.

We hope that you enjoy working through the activities in this book!



*Journey through a world filled
with Mathematics until we
reach Term 2!*



TERM 1



Counting to 200



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110
111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130
131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160
161	162	163	164	165	166	167	168	169	170
171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190
191	192	193	194	195	196	197	198	199	200

You have learnt to count up to 200.

Activity 1

1. Count on from 75 to 165 in 5s. Write the numbers.
2. Count backwards from 180 to 50 in 10s.
Write the numbers.
3. Count on from 157 to 199 in 2s. Write the numbers.
4. Count backwards from 126 to 57 in 3s. Write the numbers.
5. Count on from 172 to 200 in 4s. Write the numbers.
6. Count on from 35 to 170 in 5s. Write the numbers.
7. What numbers are between 32 and 58.
8. What number is between:

a) 79 and 81	b) 97 and 99
c) 156 and 158	d) 187 and 189
9. What number comes before 197?
10. What number comes after 129?
11.
 - a) What number is 3 less than 85?
 - b) What number is 4 more than 93?
 - c) What number is 10 more than 142?
 - d) What number is 10 less than 58?

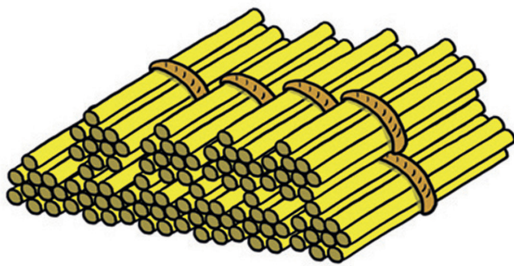
Counting backwards and forwards

Counting by grouping is a much more efficient and faster way to count.

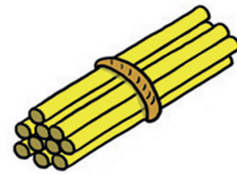
This term we will continue to learn to count up to 200.
To count in ones up to 200 would take a very long time.

Example

Look at the bundles of sticks below.



This bundle shows 100



This bundle shows 10

We use bundles of 10 sticks to help us count big numbers.

Activity 2

- I. Use the 200-number grid to do this activity:
 - a) Count in 2s. Start from 2 and write down every twentieth number.
 - b) Count in 5s. Start from 5 and write down every fifth number.

2. Copy and complete:

a) 0, 20, 40, 60, , , , ,

b) 50, 55, 60, , , ,

c) 25, 30, 35, , , 50, ,

3. Use the number grid to complete these number sequences.

a) 92, , , , 132, 142, 152

b) , , , 165, 170, 175, 180

4. Fill in the missing numbers.

a) 138 140 142

b) 158 157 154

c) 158 159 161

d) 200 198 197

5. Peter is counting:

200; 195; 190; 185; 180

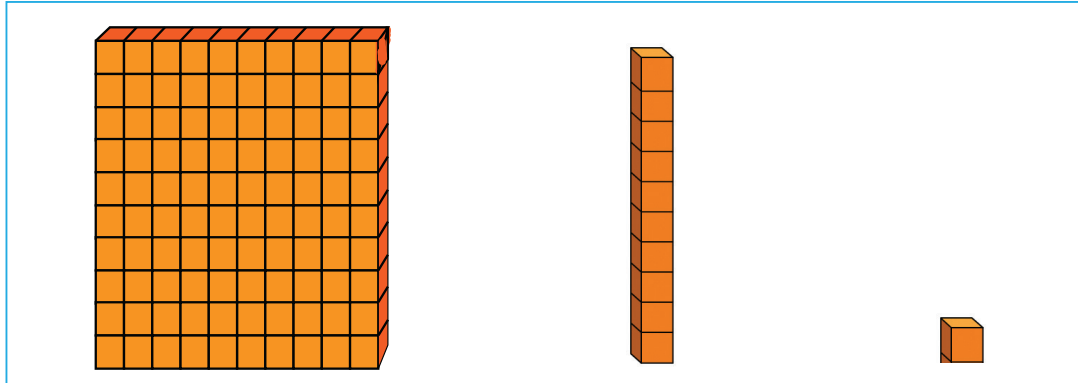
a) Explain if Peter is counting forwards or backwards.

b) Explain how Peter can get the next two numbers in this pattern.

Counting to 500

Example

We also use Dienes blocks to show numbers.



This shows 100

This shows 10

This shows 1

Counting objects by breaking numbers into groups of 10s, 20s, 50s, and even 100s, helps us to solve problems easily.

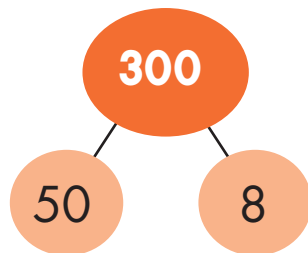
The number symbols 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9 can be used individually or combined to represent any number.

Example

Look at the number 358.

- a) Write 358 as a number name.
- b) $358 = 300 + \square + 8$
- c) What are the symbols it is made up of?

Answer

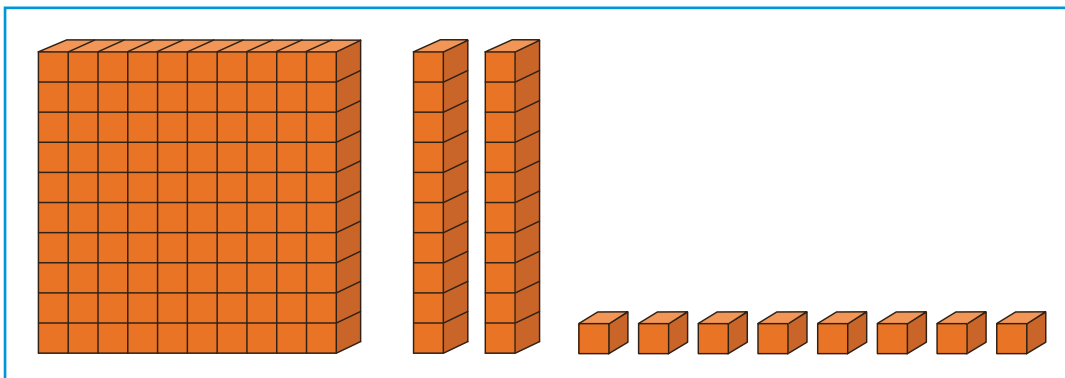


- a) Three hundred and fifty-eight
- b) $358 = 300 + 50 + 8$
- c) 358 is made up of 3, 5 and 8

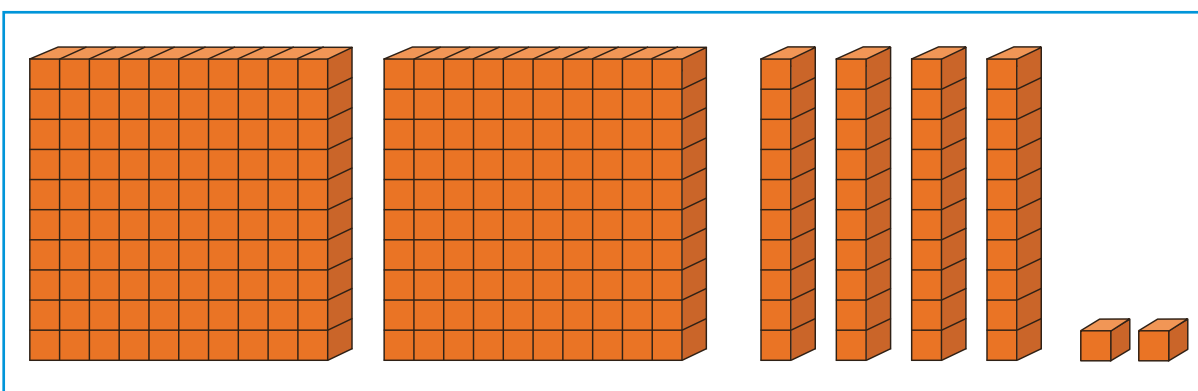
Activity 3

I. What number is shown?

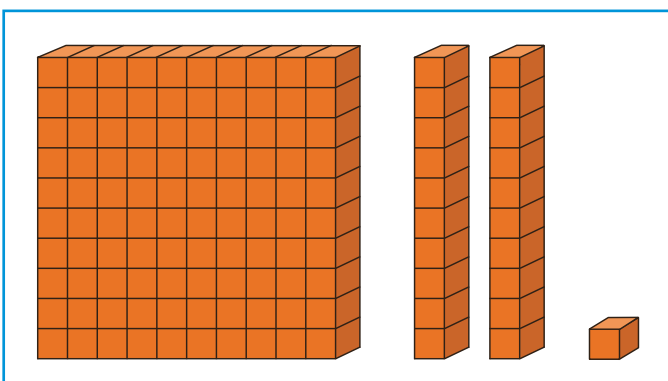
a)



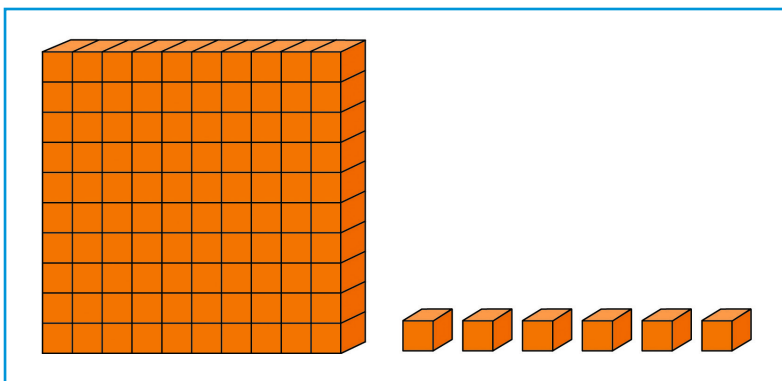
b)



c)



d)



6. Write the number names in your classwork book.

a) 106

b) 128

c) 87

d) 245

e) 175

f) 394

7. a) Match and write the number name next to the correct number symbol.

38	one hundred and forty-eight
98	one hundred and seventy-six
148	one hundred and ninety-nine
56	thirty-eight
199	eighty-seven
176	one hundred and ninety-two
87	ninety-eight
192	fifty-six

b) Rearrange the numbers stated above from smallest to greatest.

Compare, order and describe the numbers

We use **smaller than**, **greater than**, **more than**, **less than** and **equal to** when we compare numbers.

Example

Use these words to make each statement true.

smaller than

equal to

greater than

less than

- a) 138 is _____ 239
- b) 157 is _____ 1 hundreds 5 tens and 7 units
- c) 349 is _____ 328

Answer

- a) 138 is **smaller than** 239
- b) 157 is **equal to** 1 hundreds 5 tens and 7 units
- c) 349 is **greater than** 328

Example

What is 4 more than 196?

Answer

$$196 + 4 = 200$$

Activity 4

1. Use these words to make each statement true.

smaller than

equal to

less than

greater than

- a) 98 is _____ 129
- b) 339 is _____ 3 hundreds 3 tens and 9 units
- c) 487 is _____ 478
- d) 429 is _____ 4 hundreds 2 tens and 9 units

2. Complete.

- a) 1 more than 247 is _____
- b) 1 more than 398 is _____
- c) 1 more than 482 is _____
- d) 1 more than 499 is _____

3. Complete.

- a) 1 less than 279 is _____
- b) 1 less than 358 is _____
- c) 1 less than 255 is _____
- d) 1 less than 478 is _____

4. Complete.

- a) 10 more than 187 is _____
- b) 10 more than 256 is _____
- c) 10 more than 394 is _____
- d) 10 more than 487 is _____

5. Complete.

a) 10 less than 246 is _____

b) 10 less than 398 is _____

c) 10 less than 479 is _____

d) 10 less than 483 is _____

6. Order the numbers from biggest to smallest.

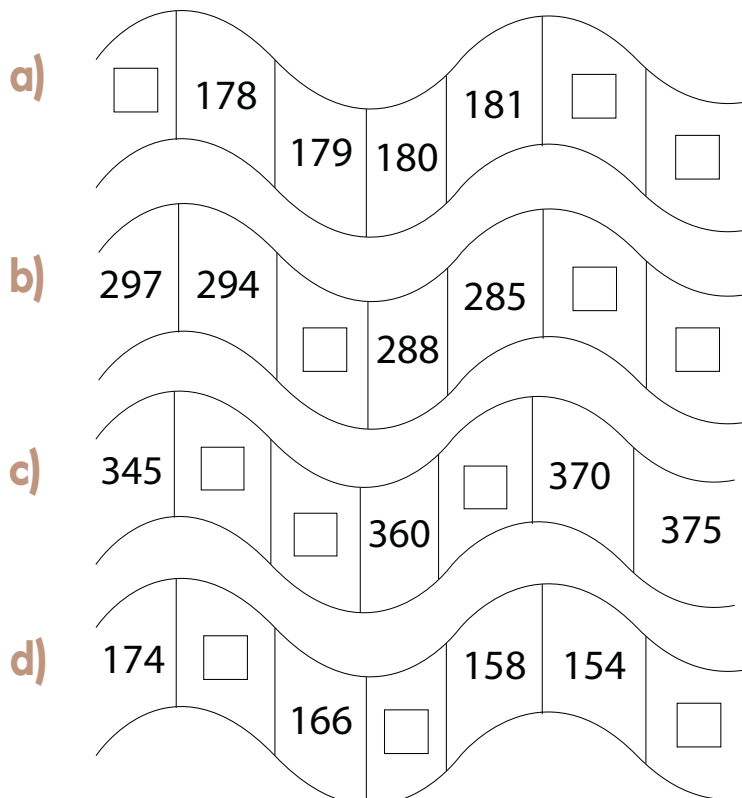
a) 45, 187, 178, 296, 389

b) 487, 387, 398, 478, 490

c) 333, 397, 467, 487, 289

d) 239, 329, 438, 389, 298

7. Look at the number tracks. Write the missing numbers.

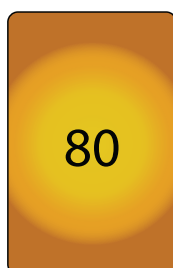


Decomposing numbers

Understanding place value is important for the work that we do in Mathematics. Once you understand numbers and how they are made up, it will become easier for you to work with them when adding, subtracting, multiplying or dividing.

Example

Use place value to break down the number 289.

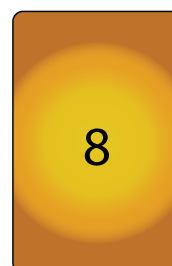
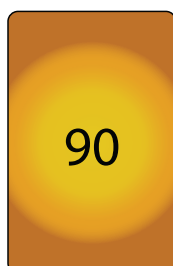


Answer

289 = 2 hundreds, 8 tens and 9 units.
= 200 + 80 + 9

Example

Explain why 498 is bigger than 398.



Answer

398 = 3 hundreds, 9 tens and 8 units


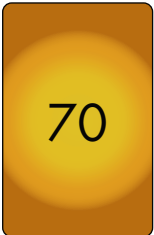
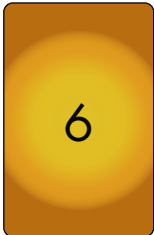




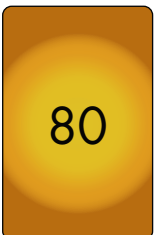


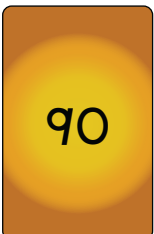

498 = 4 hundreds, 9 tens and 8 units

The tens and units are the same for each number, but there are more hundreds in the second number.



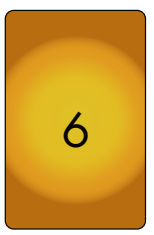

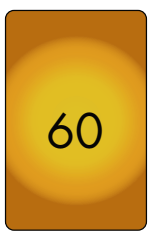


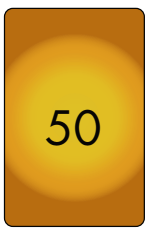
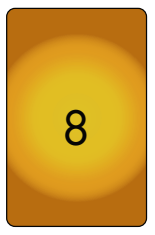

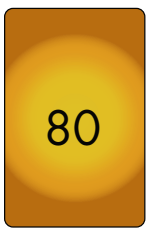

498 is bigger than 398.

Activity 5

1. What is the value of each number?

a)			
b)			
c)			
d)			

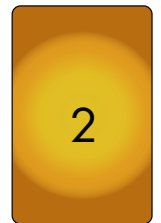
2. Compare these numbers. Write which number is **bigger than**, **smaller than** or **equal to**

a)				is _____			
b)				is _____			

c)



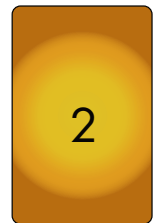
is _____



d)



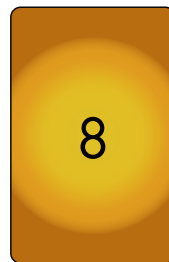
is _____



Remember that place value helps you to recognise patterns and the value of each number.

Example

a) What is the value of each digit shown?



b) Write the number symbol.

c) Write the number name.

Answer

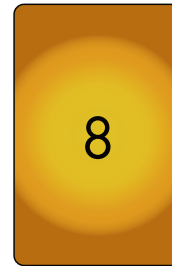
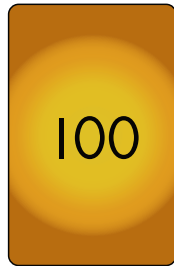
a) 70 and 8

b) 78

c) seventy-eight

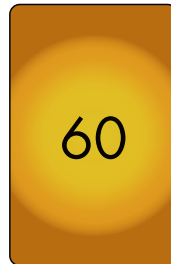
Activity 6

1. a) What is the value of each digit shown?



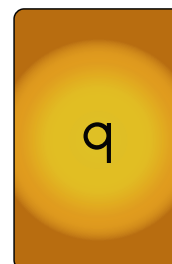
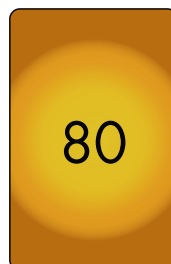
- b) Write the number symbol.
c) Write the number name.

2. a) What is the value of each digit shown?



- b) Write the number symbol.
c) Write the number name.

3. a) What is the value of each digit shown?



- b) Write the number symbol.
c) Write the number name.

4. Complete.

Example

Decompose 125.

Answer

125 = 1 group of hundreds, 2 groups of tens and 5 ones

125 = 100 and 20 and 5

- a) 178 = ____ group of hundreds, ____ groups of tens and ____ ones.
178 = ____ and ____ and 8
- b) 263 = ____ groups of hundreds, ____ groups of tens and ____ ones.
263 = ____ and ____ and 3
- c) 387 = ____ groups of hundreds, ____ groups of tens and 7 ones.
____ = 300 and ____ and ____
- d) 397 = 3 groups of hundreds, ____ groups of tens and 7 ones.
397 = ____ and ____ and ____

Addition and subtraction

Use the different strategies that you learnt in Grade 1 and 2 to add and subtract.

Example

Mike has R53 and received R39 for washing a car. How much money does Mike have in total?

Answer

Look at the technique used to solve the problem.

Number sentence	$53 + 39 = \square$
Plan	Most efficient method: Add 1 and subtract 1
Do	$\begin{aligned} 53 + 39 \\ &= (53 + 40) - 1 \\ &= 93 - 1 \\ &= 92 \end{aligned}$

Example

Mia collects gifts for a Santa Shoebox project. She collected 44 gifts on the first day and 32 gifts on the second day. How many gifts has she collected so far?

Answer

$$\begin{aligned} 44 + 32 &= 44 + (30 + 2) \\ &= 74 + 2 \\ &= 76 \end{aligned}$$

Break up only one number using place value, then add.

Example

On Friday Hazel baked 32 pancakes and on Saturday she baked 33 pancakes. How many pancakes did Hazel bake in total?

Answer

Number sentence: $32 + 33 = \square$

Another way to solve problems when the numbers are near doubles is to use the doubling technique.

Method 1

Double 32 plus 1
 $= 64 + 1$
 $= 65$

Method 2

Double 33 minus 1
 $= 66 - 1$
 $= 65$

Answer

Hazel baked 65 pancakes in total.

Check

$32 + 33 = (30 + 2) + (30 + 3)$
 $= (30 + 30) + (2 + 3)$
 $= 60 + 5$
 $= 65$

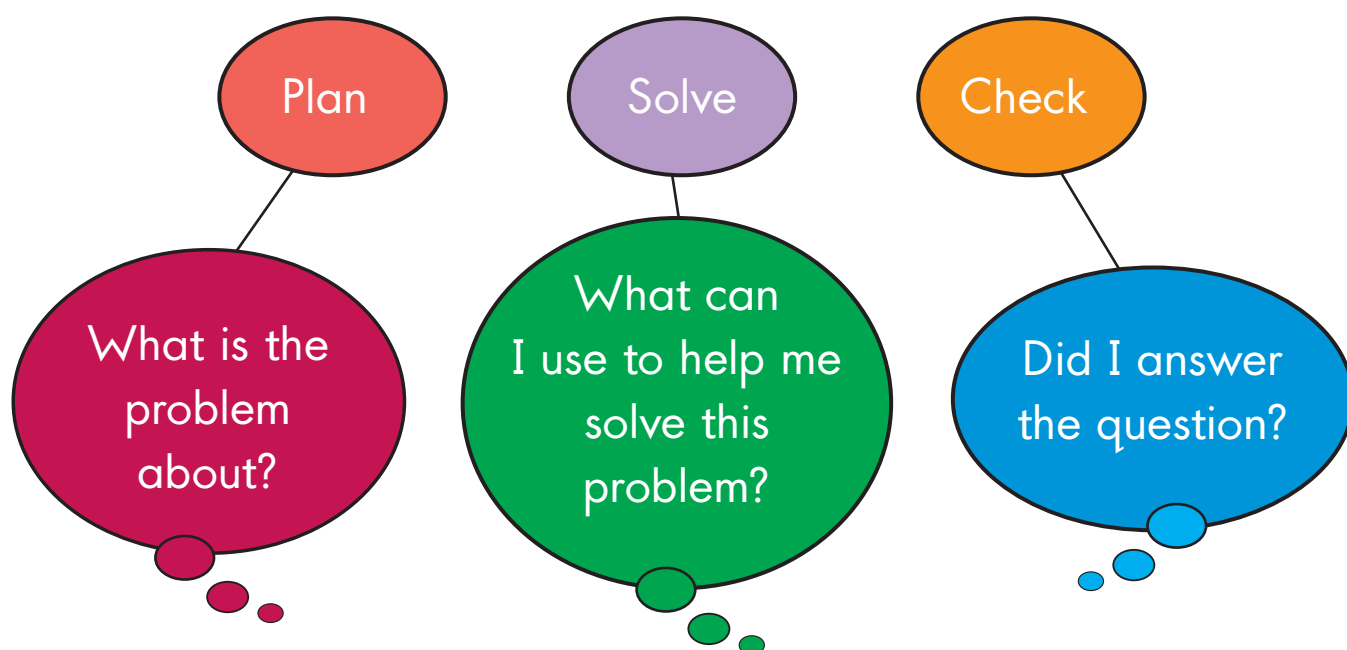
Break up the numbers using place value and check the answer.

- Explain to your friend two other techniques that you can also use to solve the problem.
- Explain to your friend why it is good practice to choose the most efficient method to solve a problem.
- Create your own problem where you will use the '*add one and subtract one*' method. Give the solution to the problem and explain why your method is the most efficient method.

Activity 7

1. Add numbers by breaking up both numbers.
 - a) $23 + 19$
 - b) $26 + 31$
 - c) $34 + 12$
 - d) $45 + 23$
2. Add numbers by breaking up one number only.
 - a) $34 + 22$
 - b) $32 + 41$
 - c) $52 + 25$
 - d) $63 + 24$
3. Add by breaking up one number into groups of 10.
 - a) $24 + 36$
 - b) $48 + 31$
 - c) $58 + 42$
 - d) $52 + 23$
4. Subtract by breaking up both numbers.
 - a) $78 - 35$
 - b) $85 - 54$
 - c) $72 - 22$
 - d) $67 - 34$
5. Subtract by breaking up one number only.
 - a) $52 - 23$
 - b) $68 - 35$
 - c) $75 - 42$
 - d) $87 - 36$
6. Subtract by breaking up one number into groups of 10.
 - a) $86 - 45$
 - b) $75 - 39$
 - c) $97 - 58$
 - d) $59 - 36$

Problem solving

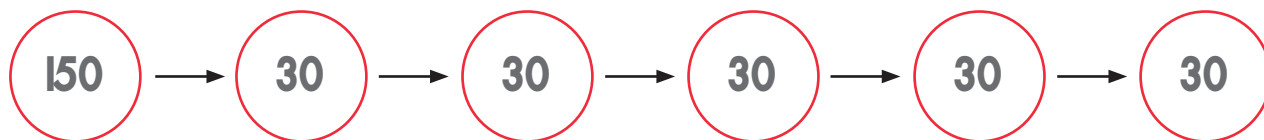


Use counters and your knowledge of place value to help you solve these problems.

Example

Sandile wants to buy his favourite movie, so he decides to save enough money from his pocket money for it. The movie costs R150. If he saves R30 each month, for how long will he have to save?

Answer



$$R30 + R30 + R30 + R30 + R30 = R150$$

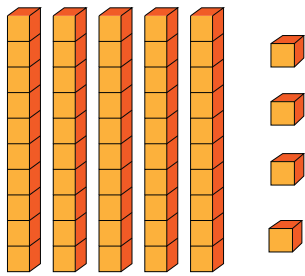
He will need to save R30 per month for 5 months.

Example

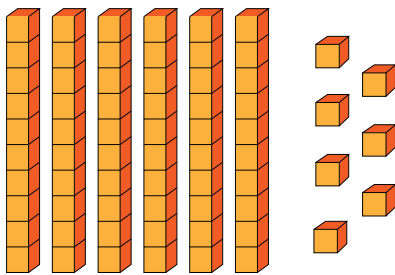
Manare has collected 54 sea shells so far. Mary has collected 67 so far.

- a) How many more sea shells does Manare have to collect to have just as many as Mary?
- b) How many counters do they have altogether?

Answer



Manare's sea shells



Mary's sea shells

a) $67 - 54 = \square$
 $(60 - 50) + (7 - 4) = \square$
 $10 + 3 = 13$

Manare needs 13 more sea shells if he wants to have the same number as Mary.

b) $67 + 54 = \square$
 $(60 + 50) + (7 + 4) = \square$
 $(50 + 50 + 10) + (7 + 3 + 1) = \square$
 $110 + 10 + 1 = \square$
 $120 + 1 = 121$

Activity 8

1. Anabelle orders 40 red roses, 25 pink roses, 15 yellow roses and 10 white roses.
 - a) How many roses altogether?
 - b) Anabelle makes bouquets to decorate different tables. If one bouquet has 4 red roses, 2 pink roses, 1 yellow rose and 1 white rose, how many roses will she need for 10 bouquets?
 - c) How many more of each colour rose will Anabelle need to get?

You can **break numbers** down into smaller parts that are easier to work with, then **build them up** again to find the solution.



Example

Fanie is given this problem to solve:

$$85 + 12 = \square$$

Answer

This is how he solved it.

$$\begin{aligned}
 85 + 12 &= \\
 &= (80 + 5) + (10 + 2) \\
 &= (80 + 10) + (5 + 2) \\
 &= 90 + 7 \\
 &= 97
 \end{aligned}$$

$$\text{So, } 85 + 12 = 97$$

2. There are 98 people at a concert. After 2 hours 36 people leave. How many people are left at the concert?
3. Half an hour before the start of the rugby match, there were 45 supporters.
- a) 23 more supporters joined. How many supporters are there now?
 - b) If 3 quarters of the supporters are males, how many female supporters are there?
 - c) At half time 16 supporters leave the stadium. How many supporters are remaining?
 - d) If the organiser expected 99 supporters, how many supporters did not show up?

Check if you can solve a given problem using doubling or halving. Try to find near doubles and work from there.

Example

Marko is given this problem to solve:

$$23 + 25 = \square$$

Answer

This is how he solved it.

23 can be written as $20 + 3$

25 can be written as $20 + 5$

$$= (20 + 3) + (20 + 5)$$

$$= (20 + 20) + (3 + 5)$$

$$= 40 + 8$$

$$= 48$$

$$\text{So, } 23 + 25 = 48$$

4. Solve the following problems:

- a) Imaan enjoys making beaded bracelets. She has 18 red beads and 23 blue beads. How many more blue beads are there than red beads? How many beads does she have altogether?



- b) Ferial and Imaan each bring their beads to make bracelets. Ferial brings 33 beads and Imaan brings 28 beads. How many beads altogether?

Using number lines can help you solve number problems.

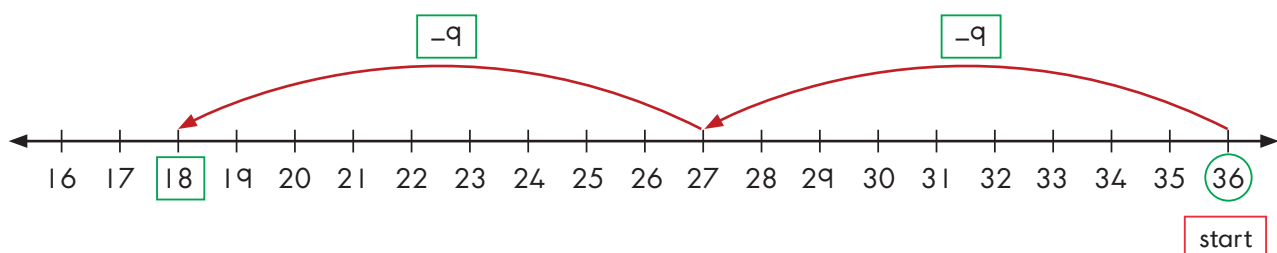
Example

Mashadi is given this problem to solve:

$$36 - 18 = \square$$

Answer

This is how she solved it.



$$36 - 18 \rightarrow 36 - (9 + 9) \rightarrow 36 - 9 \rightarrow 27 - 9 = 18$$

5. Solve the following problems:

- a) Frances and Adrienne are running cross-country races. To train, they need to run 3 times a week. On the first night they ran 5 km, on the second night they ran 10 km, and on the third night they ran 12 km. How many kilometres did they run altogether?



- b) If they run 15 km on another night, how many kilometres will they have run altogether?

Repeated addition

Here are some of the words we use to describe multiplication.

times

three times
as much

twice

double

groups of

multiply

multiplied
by

Example

Multiplication can be done in any order. It doesn't matter in what order you multiply, your answer will always be the same.

Complete.

$4 \times 5 = \square$

$5 \times 4 = \square$

Answer

$4 \times 5 = 20$

$5 \times 4 = 20$

The answer for both is 20.

Activity 10

I. Copy and complete.

a) $6 \times 3 =$ _____

$3 \times 6 =$ _____

b) $8 \times 4 =$ _____

$4 \times 8 =$ _____

c) $5 \times 3 =$ _____

$3 \times 5 =$ _____

d) $7 \times 4 =$ _____

$4 \times 7 =$ _____

2. Complete:

a) $6 \times 5 = 30$

so $5 \times 6 = \underline{\hspace{2cm}}$

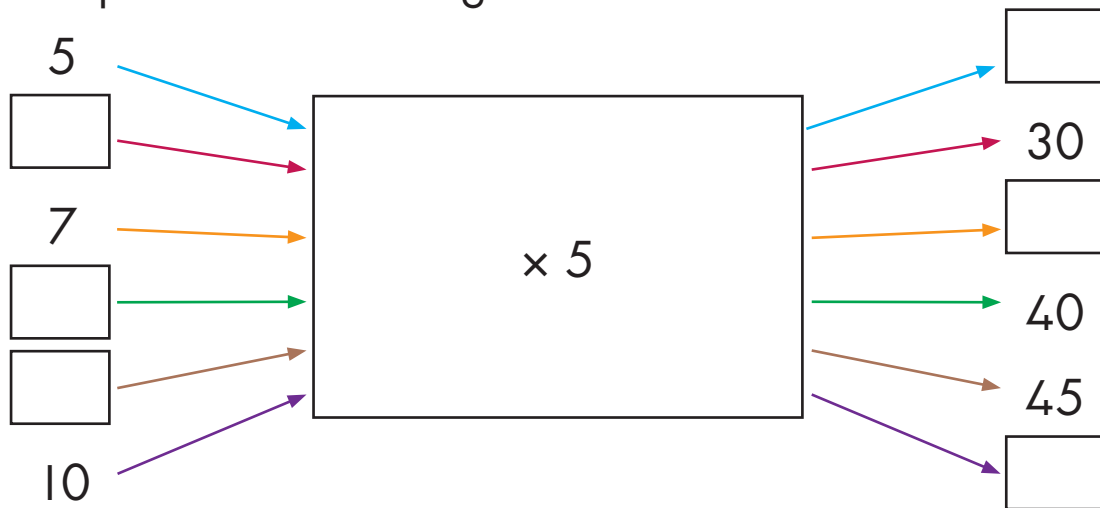
b) $2 \times 4 = 8$

so $4 \times 2 = \underline{\hspace{2cm}}$

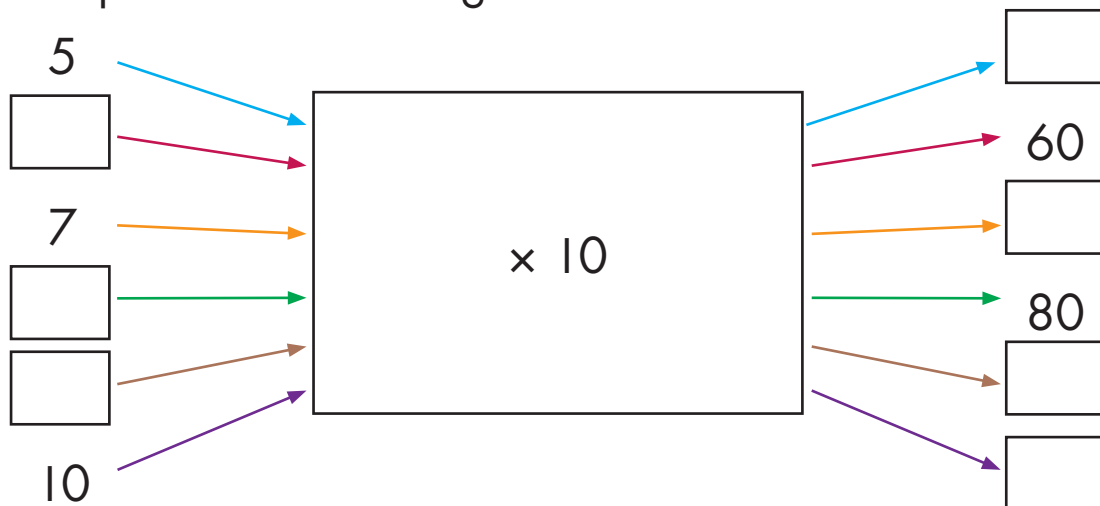
c) $4 \times 3 = 12$

so $3 \times 4 = \underline{\hspace{2cm}}$

3. Complete the flow diagram.



4. Complete the flow diagram.



5. Complete:

a) $6 + 6 + 6 = 18$

so $3 \times 6 = \underline{\hspace{2cm}}$

b) $5 + 5 + 5 + 5 = 20$

so $4 \times 5 = \underline{\hspace{2cm}}$

c) $10 + 10 + 10 = 30$

so $3 \times 10 = \underline{\hspace{2cm}}$

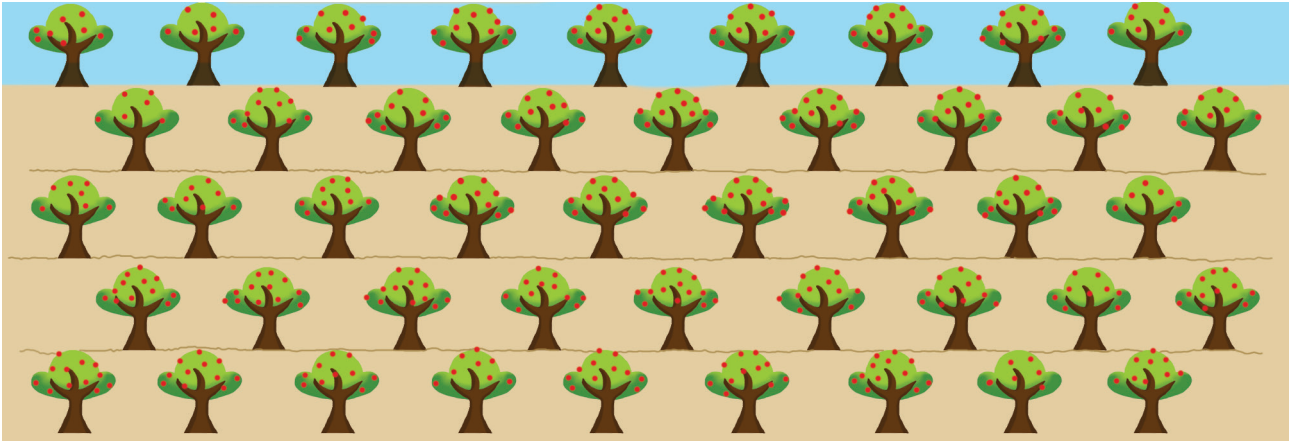
d) $7 + 7 + 7 = 21$

so $3 \times 7 = \underline{\hspace{2cm}}$

Repeated addition is the same as multiplication.

Example

Sinzano is planting apple trees. She plants 9 trees in 5 rows. Use repeated addition to work out how many trees there are.



Answer

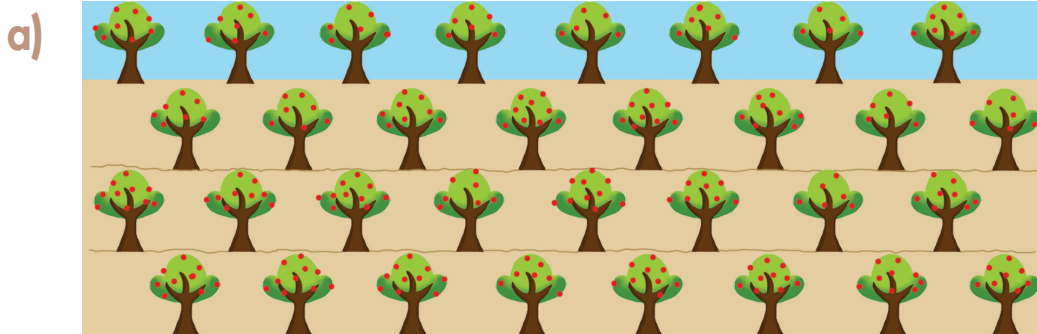
$$9 + 9 + 9 + 9 + 9 = 45 \quad \text{OR} \quad 5 \times 9 = 45$$

Solve the following problems using repeated addition.

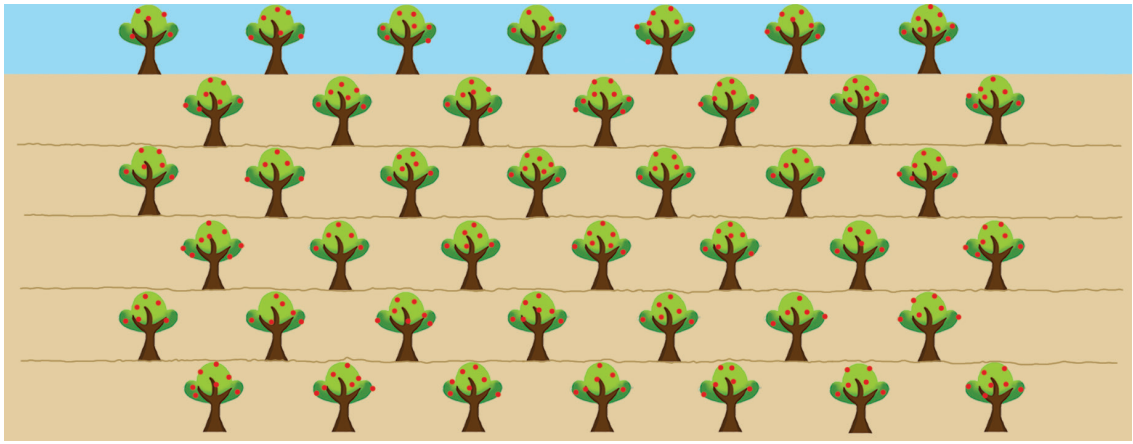
Activity II

1. a) $4 + 4 + 4 + 4 + 4$ is the same as \times
- b) $7 + 7 + 7 + 7$ is the same as \times

2. How many trees?



b)



3. Victor makes soup for the soup kitchen.
- a) He uses 5 potatoes. He uses twice as many carrots. How many carrots does he use?
 - b) He uses 10 litres of water. If he adds 2 litres of water every hour for 4 hours, how many litres of water has he added to his soup?
 - c) If Victor makes a 10-litre pot of soup he uses 5 onions, 8 potatoes, 16 carrots, and 2 packets of samp and beans. How much of each type of ingredient will he need for only half of this soup?
 - d) From a 10-litre pot of soup, Victor can dish 4 big bowls of soup. If each big bowl fills 8 smaller bowls, how many people can eat a bowl of the soup?
4. Angus is 9 years old. How old is:
- a) his brother, if he is twice as old as Angus?
 - b) his father, if he is four times as old as Angus?
 - c) his grandfather, if his grandfather is twice as old as Angus's father?

Grouping and sharing

Problems that involve sharing are often about sharing equally, and how much each one gets.

Example

Share 16 storybooks equally amongst 5 learners.

- a) How many books will each learner get?
- b) How many books will be remaining?

Answer

- a) Each learner will get 3 books each.
- b) There will be 1 book remaining.

Problems that involve grouping are often about how many groups can be made.

Example

The learners and teachers at Simunye Primary are going to watch a puppet show. There are 30 learners and 2 teachers. If 1 minibus can fit 12 people, how many minibuses would the group need?

Answer

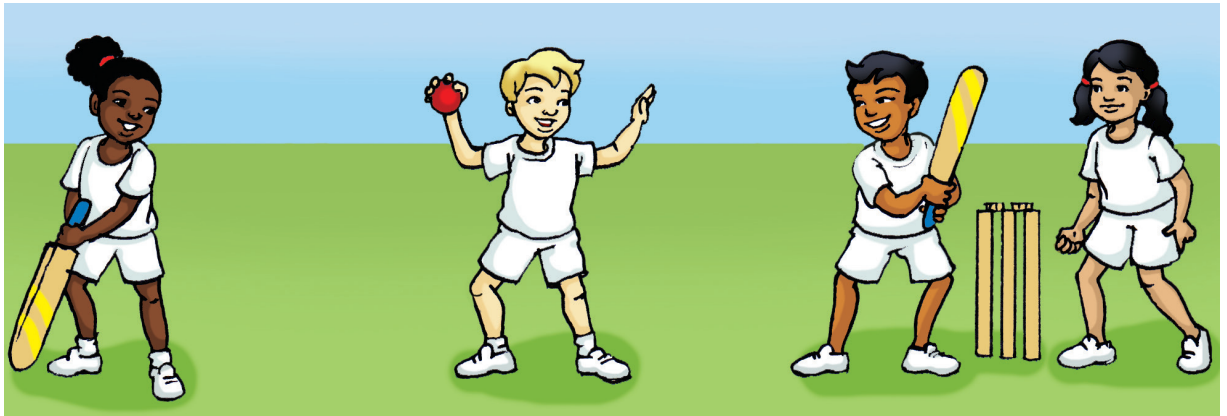
There are 32 people altogether.
If each minibus can only fit 12 people, they need 3 minibuses.

Now solve these problems.

Activity II

1. Estimate first.

- a) 42 learners want to play mini-cricket. How many teams of 11 players will there be?
- b) Is your estimate more than 5 or less than 5?
- c) Calculate the correct number. Are there any learners left over?



2. Share 48 counters amongst 13 children.

- a) How many will each child get?
- b) Are there any remaining?

Division is what we do when we work with sharing and grouping. We share a number of objects into groups of equal sizes, sometimes with a remainder and sometimes without.

This is the symbol we use for division \div

To divide, we need to know:

- the total number of objects
- **either** the number of groups, **or** the number of objects in each group.

Example

Marlene buys 44 sweets. She divides them equally into 4 packets to sell. How many sweets are there in each packet?

Answer

44 sweets shared among 4 packets equals to 11 sweets in each packet.

Use division to help you solve these problems.

3. Share 50 sweets amongst 10 friends so that they all get the same number of sweets. How many does each friend get?



4. There are 48 learners going to a school camp. The leader wants to divide the learners into equal groups of 6. How many groups will there be?
5. There are 24 learners in a class. Half the learners are girls. How many boys are in the class?

Fractions

1 third is shaded



3 quarters are shaded



4 sixths are shaded



5 eighths are shaded

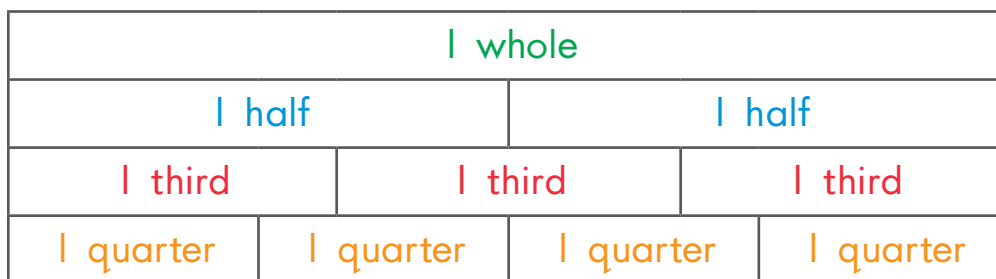


A fraction is a part of a whole. This year we will work with **non-unitary** fractions. Look at the example below.

Example

Look at the fraction wall.

- a) How many thirds are there in a whole?
- b) How many quarters are there in a whole?
- c) How many halves are there in a whole?



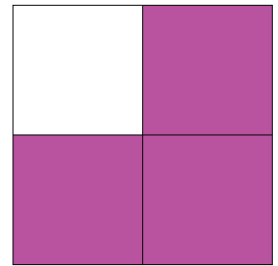
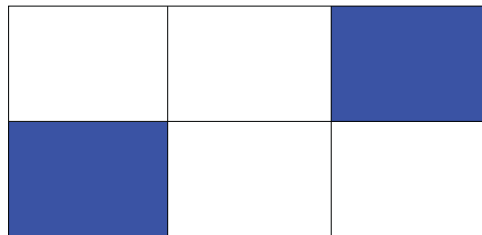
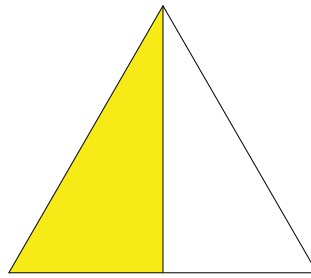
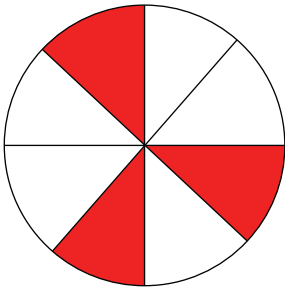
Answer

- a) There are three thirds in a whole.
- b) There are four quarters in a whole.
- c) There are two halves in a whole.

One half is a **unitary fraction**, whereas two quarters is a **non-unitary fraction**.

Activity 12

1. Look at each drawing below.
 - a) Count the number of parts.
 - b) Count the number of shaded parts, and write the fraction.
 - c) Count the number of unshaded parts, and write the fraction.



2. Find the fraction:
 - a) Find $\frac{1}{3}$ of 9 sweets.
 - b) Find $\frac{1}{5}$ of 15 marbles.
3. Idah's friend has 12 ribbons and gives Idah 4. What fraction of the ribbons was given to Idah?

4. Sipho wants to save $\frac{1}{4}$ of his pocket money every month. If he gets R20 per month, how much money must he save?



5. Solve the following problems. Use drawings to help you.
- a) Mpho and her 4 sisters must share 6 apples equally until there is nothing remaining. How many apples will each child get? Write your answer as a fraction.
 - b) 12 learners travel together in a school taxi to a hockey match. The coach gives them 28 energy drinks to share equally amongst themselves until there is nothing remaining. How many will each learner get? Write your answer as a fraction.

Working with money

The coins we use in South Africa are:



The bank notes we use in South Africa are:



Activity I3

- I. Solve the following problems.
 - a) Monique sells school tracksuits at R150 each. How much money would she get from selling 3 school tracksuits?
 - b) If Monique makes a profit of R80 on each tracksuit, how much profit would she make on the sale of the 3 tracksuits?

2. Sandile runs a project where he buys stationery packs for school children who need them, but can't afford to buy them.
- a) Sandile needs R750 for 10 packs. If he has raised R320 for the packs so far, how much money does he still need to raise?
 - b) If 5 more children need stationery packs, how much money would Sandile need to raise for this?

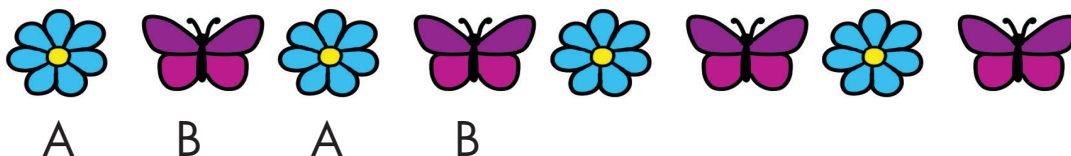


Geometric patterns

In Grade 2 you learnt that we can use letters to show how patterns are formed. Let's revise how to do this.

Example

Describe the pattern using letters.

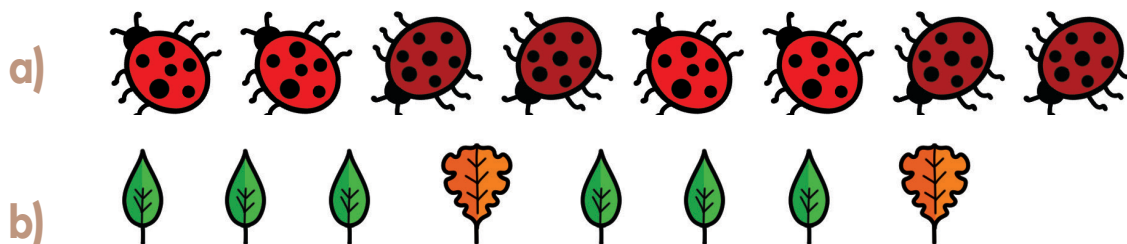


Answer

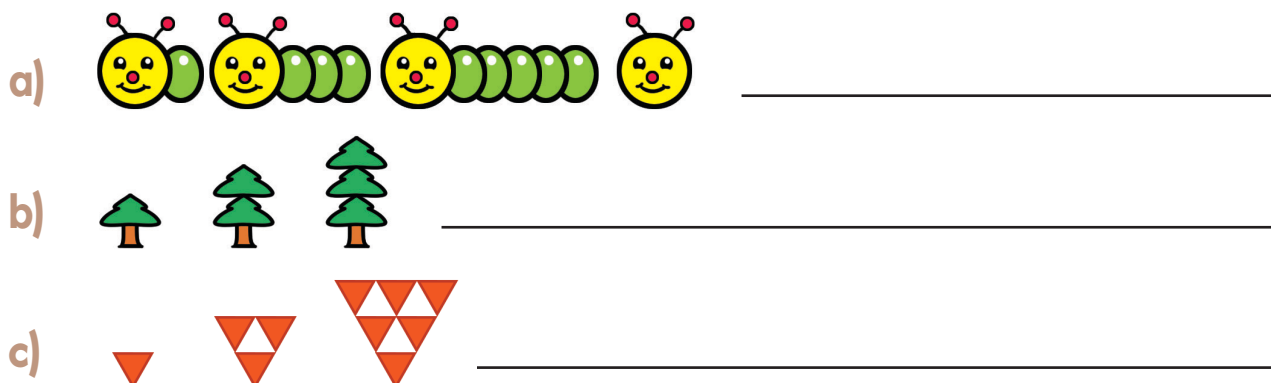
A B A B

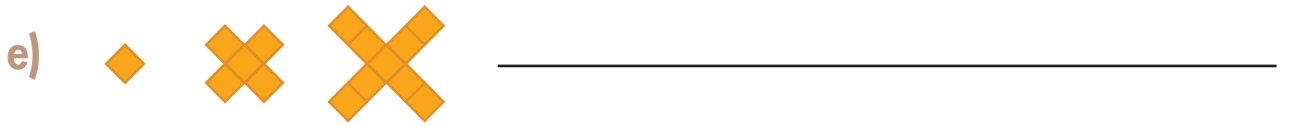
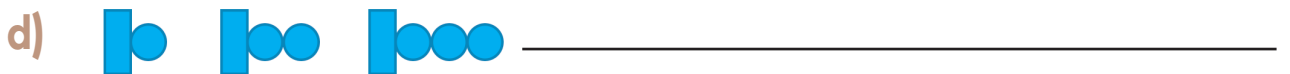
Activity 14

1. Describe each pattern using letters.



2. Copy and extend each growing pattern. Describe the pattern to a friend.





3. Come up with your own pattern, then ask your friend to add one more group to complete it.

Number patterns

A pattern is the same thing repeated over and over again.

There are three types of patterns:

Repeating patterns – the **core** of the pattern is the smallest part that repeats.

Core



2; 8; 2; 9; 2; 8; 2; 9; 2; 8; 2; 9; ...

Growing patterns – the numbers get bigger in a predictable way.

1; 4; 7; 10; 13; 16; ...

Decreasing patterns – the numbers get smaller in a predictable way.

27; 22; 17; 12; 7; 2

Activity 15

1. Copy and complete these patterns. Write what type of pattern each one shows.

- a) 182; 184; 186; ; ; ; ; ;
- b) 85; 90; 95; 85; 90; 95; ; ; ; ; ;
- c) 190; 180; 170; ; ; ; ; ;
- d) ; ; 152; 155; 158; ; ; ;
- e) ; ; ; ; ; ; 124; 128; 132

2. a) Is this a:

growing pattern; or decreasing pattern?

44; 48; 52; 56; 60; 64; 68

- b) What is the missing number?

158	159	160	<input type="text"/>	159	160
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- c) What is the number pattern counting in?

0; 25; 50; 75; 100; 125; 150

- d) What will the next numbers be?

120; 130; 140; 150; 160;

We can also write a number pattern in a table.

Example

Write a number pattern for the number of eyes for a group of people using a table.

Number of people	1	2	3	4	5	6	7	8
Number of eyes								

Answer

Number of people	1	2	3	4	5	6	7	8
Number of eyes	2	4	6	8	10	12	14	16

3. Copy and complete the following tables:

a)

Number of hands	1	2	3	4	5	10	12	14
Number of fingers on hands	5	10	15					

b)

Number of cows	1	2	3	4	5	10	12	14
Number of legs	4	8	12					

c)

Number of tricycles	1	2	3	4	5	10	12	14
Number of wheels	3	6	9					

Number patterns can also be written differently.

Example

a) Complete the table.

Number of hands	1	2	3	4	5
Number of fingers on hands	5	10	15		

b) Describe the pattern.

c) Show the pattern using a flow diagram.

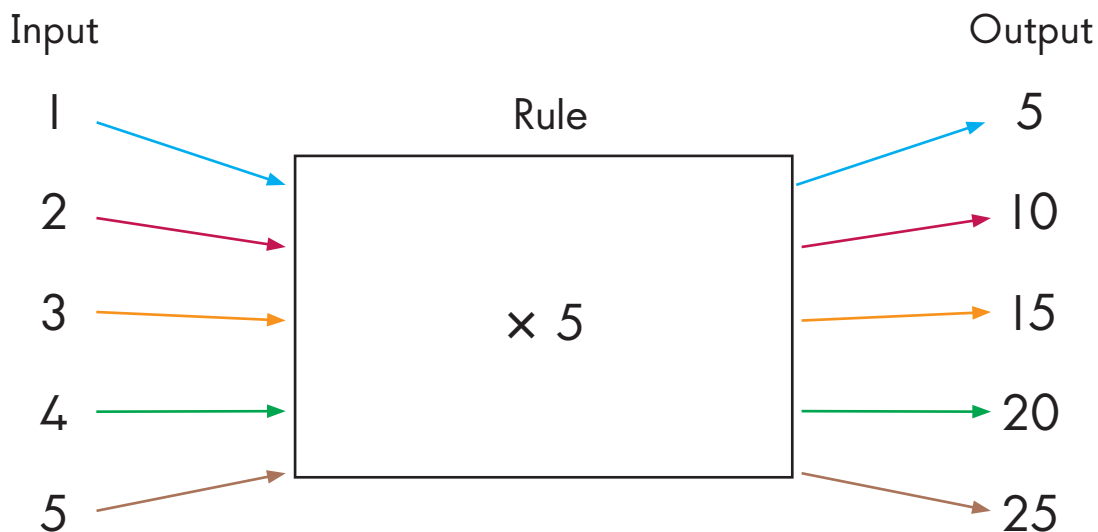
Answer

a) The number of fingers is 5 times.

Number of hands	1	2	3	4	5
Number of fingers on hands	5	10	15	20	25

b) We can describe the pattern by saying: The number of fingers is 5 times as many as the number of hands.

c) We can show this using a flow diagram, as shown below:



4. Draw a flow diagram for the following table.

Number of people	1	2	3	4	5
Number of fingers on two hands	10	20	30	40	50

5. Complete the following tables:

a)

Rule: Subtract 4	
Input	Output
90	
120	
150	
180	

b)

Rule: Subtract 5	
Input	Output
70	
120	
150	
180	

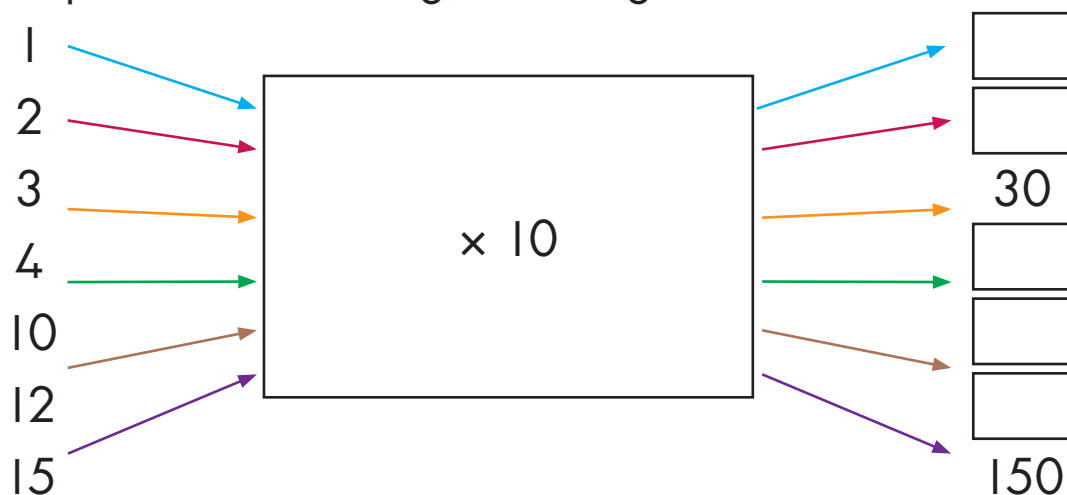
c)

Rule: Add 7	
Input	Output
60	
70	
80	
90	

d)

Rule: Add 10	
Input	Output
105	
125	
145	
165	

6. Complete the following flow diagram:



Reading dates on a calendar

Here is a calendar for the month of February. Use the calendar to answer the following questions.

FEBRUARY						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

Activity 16

- I. Valentine's day is on 14 February.
 - a) What day is the first day of February?
 - b) On what day is Valentine's Day according to the calendar?
 - c) Is Valentine's Day a holiday?
 - d) Kobus bought his parents a present 2 days before Valentine's Day. When did he buy the present?



- e) His father's birthday is a week after Valentine's Day. When is Kobus's father's birthday?

- f) All grade 3 learners will write a test five days before Valentine's Day. On what date is the test?
- g) How many Saturdays are there in February?
- h) How many days are in February?
- i) Is this a leap year? Explain.

2. Copy this calendar in your classwork book.

Month:						Year:	
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	

- a) Draw pictures of events that will take place at your school during this month. Show the dates on which the events will take place.
- b) Find out who in your class was born during this month. Write their names on the dates on which they were born.
- c) Show any holidays in the calendar for this month.

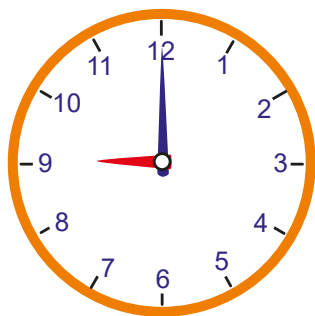
3. Find your birthday on a calendar.

- a) On what day is your birthday this year?
- b) How many days are there in your birthday month?

Learn about the digital clock

The clock below is used to measure time.

Example



This kind of clock is called an **analogue clock**.

It shows hours and minutes using pointers called hands.

The short hand shows hours. It points to 9.

The long hand shows the minutes. It points to 12.

The time is nine o'clock.

The time is written as 9 o'clock.

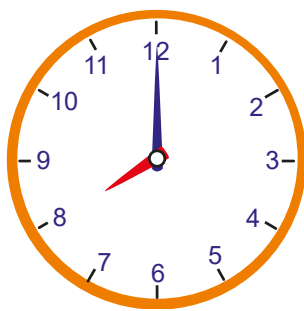
Activity 17

I. Write the times shown on each of the clocks.

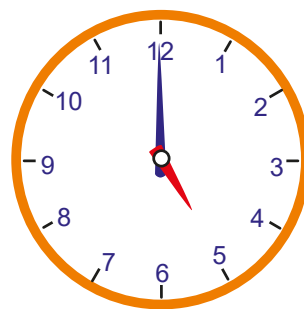
a)



b)



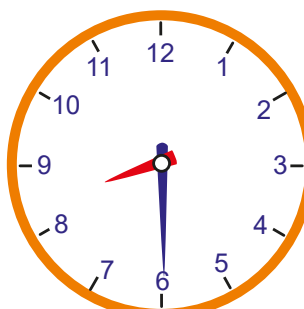
c)



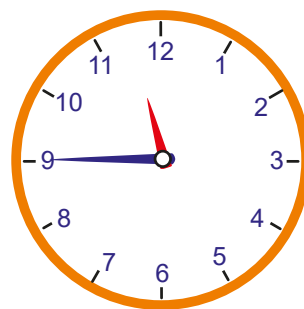
d)



e)



f)



Example



The clock on the left is called a digital clock. A digital clock has no hands.

On a digital clock, time is displayed in numbers. The colon (:) is used to separate hours from minutes.

Hours are written to the left of the colon.

Minutes are written to the right of the colon.

Nine o'clock is written as 9:00.

2. Draw a digital clock in your classwork book and show the following times.

a) 10 o'clock.

b) 12 o'clock.




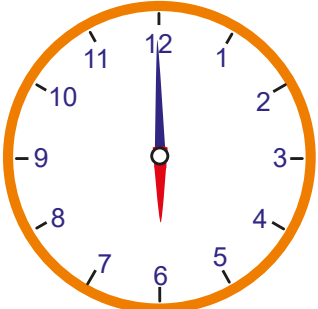


c) 9 o'clock.

d) 6 o'clock.

Past the hour

We express time as minutes past the hour up to half past the hour. Let's use 6 o'clock as an example.

We express time as minutes past 6 up to half past 6.

Six o'clock	Quarter past six	Half past six
		
		

3. What is the time?



4. What is the time?



Minutes to the hour

After half past the hour we start thinking about the number of minutes left to complete the hour.

When the minute hand is pointing at 9, there are 15 minutes left before it is the next hour.

15 minutes is a quarter of an hour.

Half past six	Quarter to 7	7 o'clock

5. Show the time on an analogue clock.



6. What is the time shown on the clock?



Telling time in minutes

The time shown on the clocks below is five minutes past twelve or five past 12.





Analogue clock	Digital clock

Activity 18

1. What is the time?

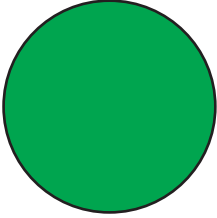

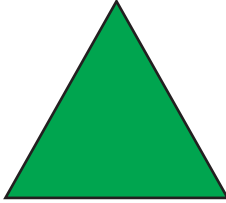



2. Draw a digital clock showing these times:
- ten minutes to seven
 - ten minutes past twelve
 - forty-five minutes past eight
 - five minutes to eleven
 - twenty minutes past five
 - twenty-five minutes to nine.
3. Give the answer in digital form. What is the time:
- a quarter of an hour before 10?
 - half an hour before 10?
 - twenty minutes before 10?
 - five minutes before 10?
 - an hour before 10.
4. Use the time provided to answer the following.

What time is it?		
	a) 15 minutes after the time shown on the clock?	b) an hour after the time shown on the clock?
	c) 30 minutes after the time shown on the clock?	d) 15 minutes after the time shown on the clock?
	e) an hour after the time shown on the clock?	f) 30 minutes after the time shown on the clock?
	g) 30 minutes after the time shown on the clock?	h) an hour after the time shown on the clock?

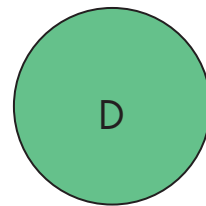
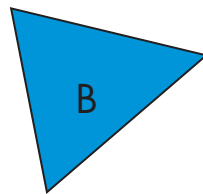
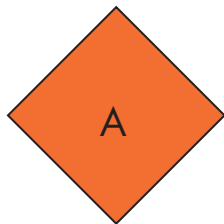
Two-dimensional shapes

A two-dimensional shape has a flat surface like a piece of paper.

Circle	Square	Triangle	Rectangle
			
A circle is a shape that is round.	A square has four straight sides of the same length.	A triangle has three straight sides.	A rectangle has four straight sides. The opposite sides are equal in length.

Example

Name the shapes, and write their names.



Answer

A – Square

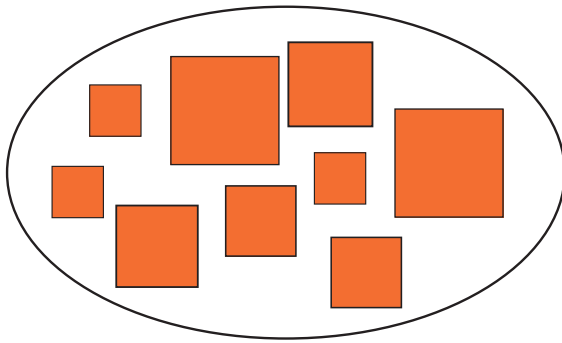
B – Triangle

C – Rectangle

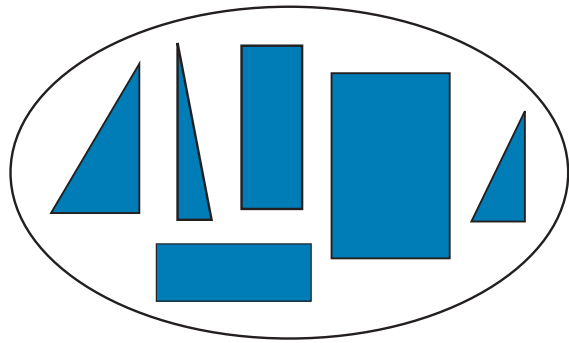
D – Circle

Example

Look at the two groups. How were they sorted?



Group A



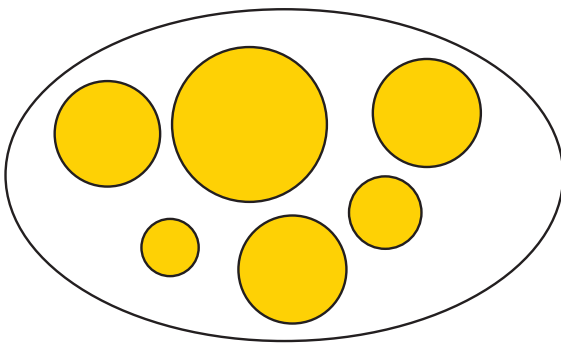
Group B

Answer

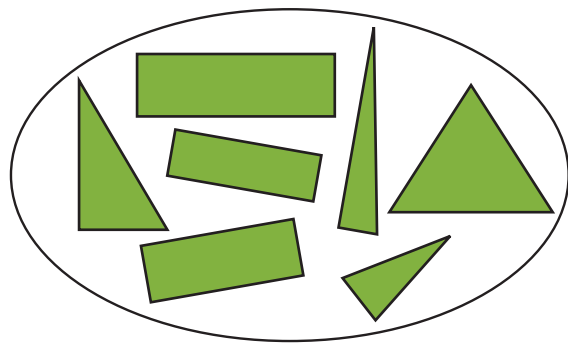
Group A: All orange, all squares with four equal straight sides.
Group B: All blue, with different shapes.

Example

Look at the two groups. How were they sorted?



Group A



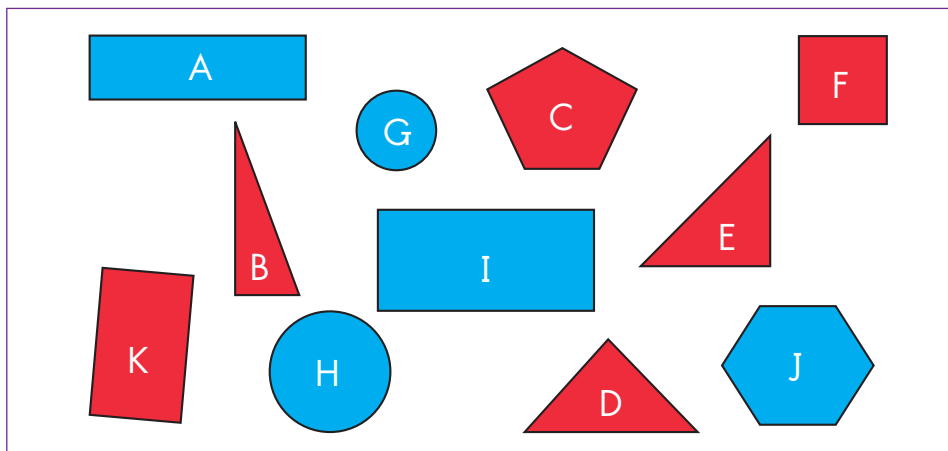
Group B

Answer

Group A: All yellow; all circles; and all round.
Group B: All green rectangles and triangles, and all with straight sides.

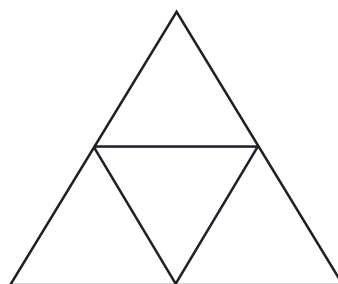
Activity 19

1. Look at the shapes and answer the questions.



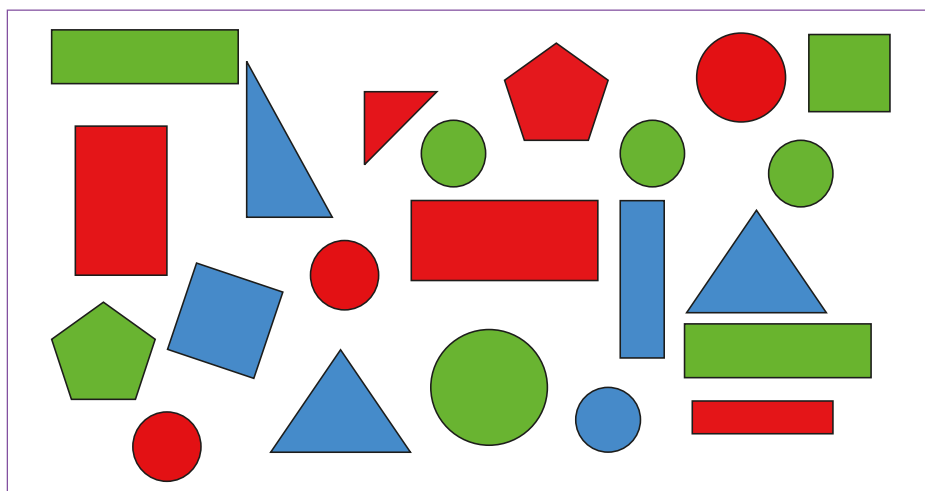
- Name each shape.
- Copy them into your classwork book.
- Write their names in your classwork book.

2. a) How many triangles are there altogether in the diagram?






b) Explain how you got the answer for a).

3. Look at the shapes in the frame and answer the questions.



- a) How many red circles are in the frame?
 - b) How many blue triangles are in the frame?
 - c) How many green rectangles are in the frame?
 - d) How many blue squares are in the frame?
 - e) How many shapes with straight sides are in the frame?
 - f) How many round shapes are in the frame?
4. a) Draw a picture using three triangles, four squares, four rectangles, and five circles.
- b) Draw a picture using six triangles, four squares, four rectangles, two large circles, and four small circles.
5. Copy and complete the table. Tick ✓ if the sides are straight and cross ✗ if the sides are not straight. Do not draw the shapes.


	Shapes		Number of sides	Straight sides
eg	Triangle		3	✓
a)	Rectangle			
b)	Square			

Data cycle and the tally table

After we collected data we need to organise the data and then represent it. When we collect data, we use a tally table to record it.





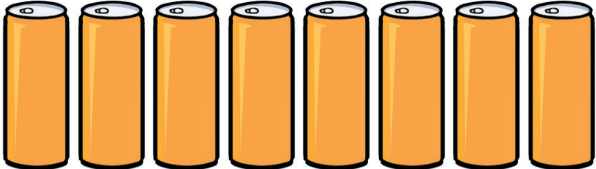

We can use tallies to organise the data into categories.

How to organise data in a tally table:

- We draw a single line for each item. This line is called a tally mark.
- We group tally marks in groups of five . This makes it easy to count the tally marks.
- The frequency is the total number of tally marks.

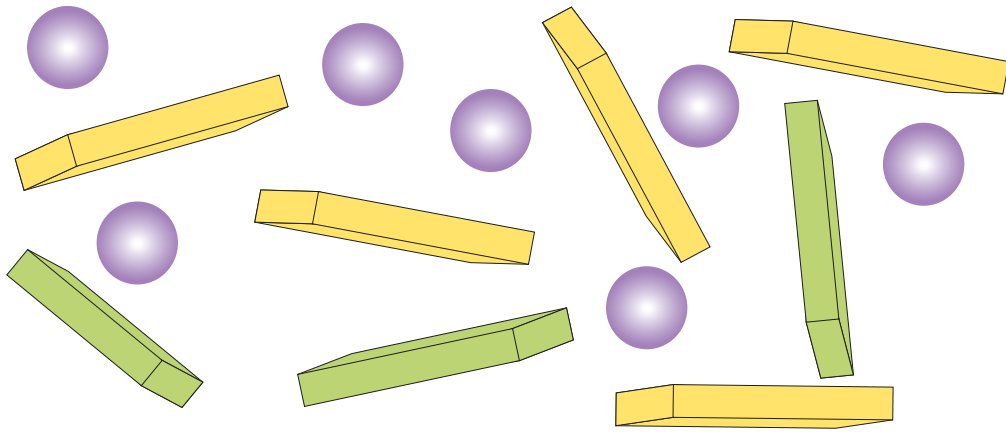
Example

Look at the tally table.

Number of three-dimensional objects	Tally marks	Frequency
		3
		5
		8

Example

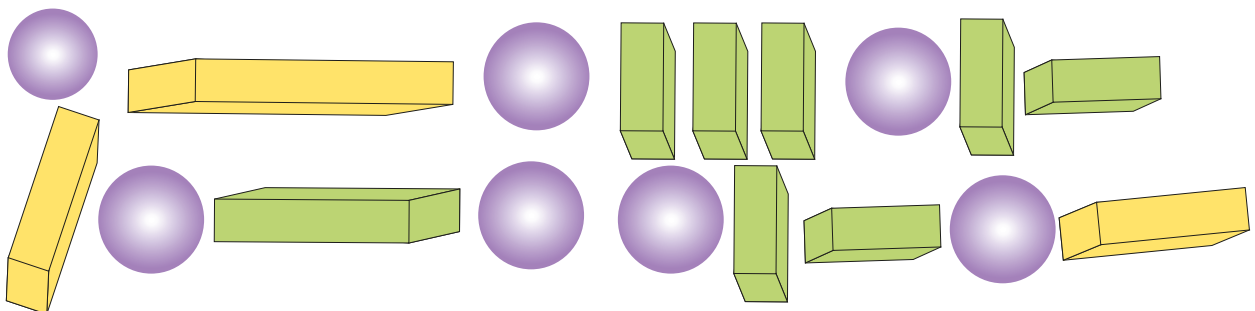
Look at the three-dimensional objects and use a tally table to organise the data into rectangular prisms (boxes) and spheres (balls).

**Answer**

Three-dimensional objects		
	Tallies	Frequency
Rectangular prisms (boxes)		8
Spheres (balls)		7

Activity 20

1. Look at the objects and complete the tally table to organise the data.



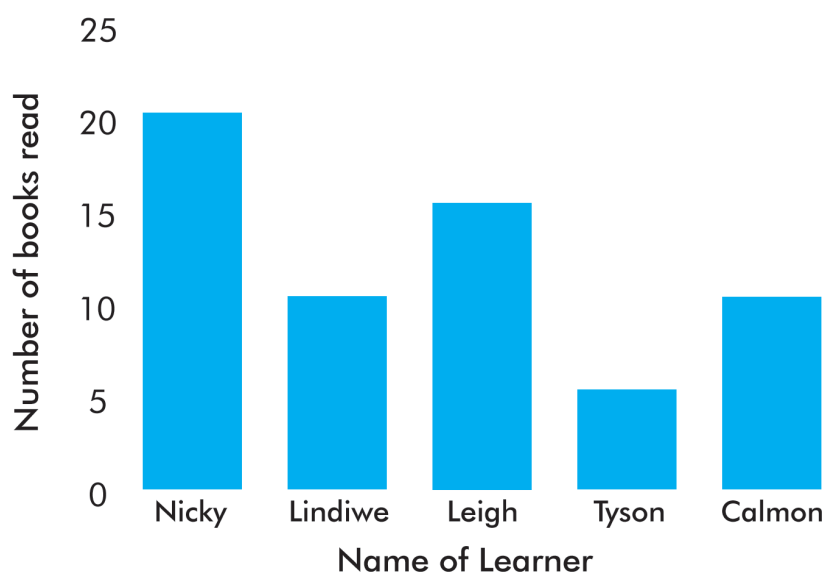
Three-dimensional objects		
	Tallies	Frequency
Yellow rectangular prisms (boxes)		
Green rectangular prisms (boxes)		
Purple spheres (balls)		

When drawing a bar graph:

- the bars must not touch each other,
- the bar graph must have a heading,
- both the axes must be labelled.

Example

The bar graph shows the number of books read by five learners during the school holiday.



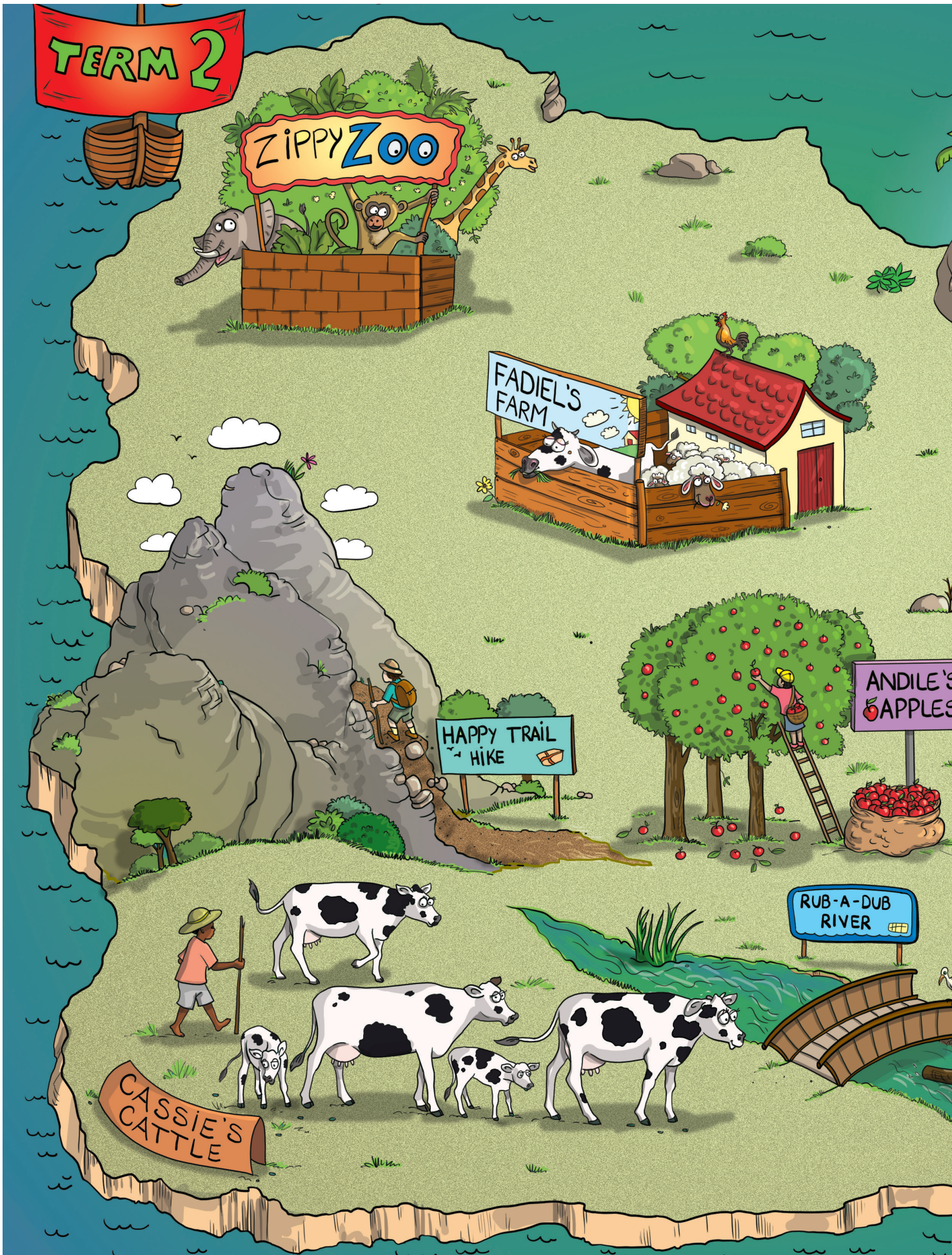
1. Who read the most books during the holiday?
2. Who read the least number of books during the holiday?
4. Who read 15 books during the holiday?
5. Who read the same number of books?

Answer

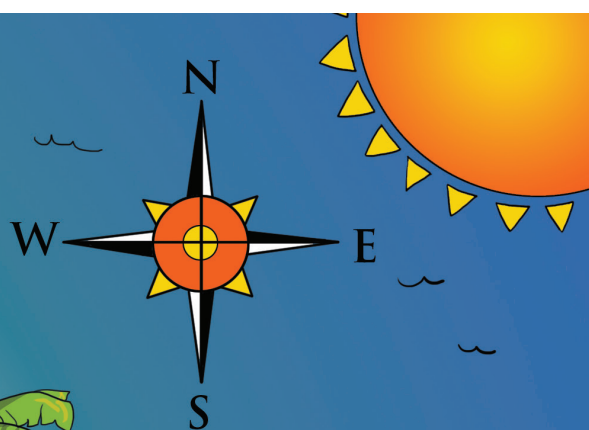
1. Nicky
2. Tyson
3. Leigh
4. Lindiwe and Calmon

Activity 21

1. Draw a bar graph to show the data from the table.
2. Answer the following questions:
 - a) How many yellow rectangular prisms are there?
 - b) How many green rectangular prisms are there?
 - c) How many more green rectangular prisms are there than yellow rectangular prisms?
 - d) How many rectangular prisms are there altogether?
 - e) How many more rectangular prisms are there than spheres?



Mathematics is all around us.
Open your imagination and
join us all the way to Term 3!



TERM 2



Number symbols and number names

When writing number names from 21 and 99, we use a hyphen (-).

Number symbol	Number names
39	thirty-nine
84	eighty-four
99	ninety-nine

This is how we write number names bigger than 100.

Number symbol	Number names
101	one hundred and one
235	two hundred and thirty-five
250	two hundred and fifty

Activity 1

1. Write the number symbol and number name.

	Number symbol	Number names
a)	188	
b)		one hundred and three
c)		two hundred and twenty-one
d)	243	
e)	175	

2. Read this note. Find the number names, copy it in your classwork book and write the number symbol for each one.

- My darling Mom
- I need two hundred and fifty sweets because
- I want to share them with my forty friends.
- I also need eighty-four chocolates as I want
- to give them to the twenty-one teachers at
- the school.
-
- Lots of love
- One hundred and fifty-three kisses and two
- hundred and forty-seven hugs.

3. Write the number symbol for the following number names:
- a) four hundred and five
 - b) three hundred and nine
 - c) two hundred and fifty
4. Copy the number names from the text below and write the number symbols.

My favourite number is fifty-four. I hope there is two hundred and five rand in my purse. I can write one hundred and twenty-eight numbers on the board.

5. Read this article about the lions and complete the table below.

Facts about lions

Wild male lions can live for about 12 years and females for about 15 years.

Lions sleep about twenty hours in a day.

A male lion has a mass of about 190 kg.

A female lion has a mass of about 129 kg.

The length of the lion's tail is about ninety-five cm.



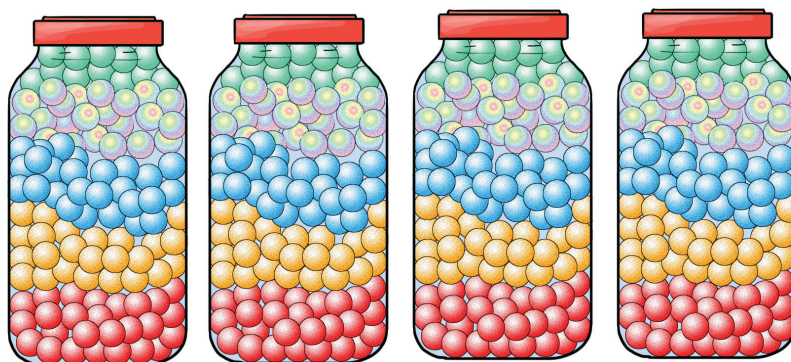
	Number symbol	Number names
a)	12	
b)	15	
c)		twenty
d)	190	
e)	129	
f)		ninety-five

Counting objects

We can group objects to count them.

Example

It is estimated that about 100 sweets fill a jar.
How many sweets are there in the four jars.

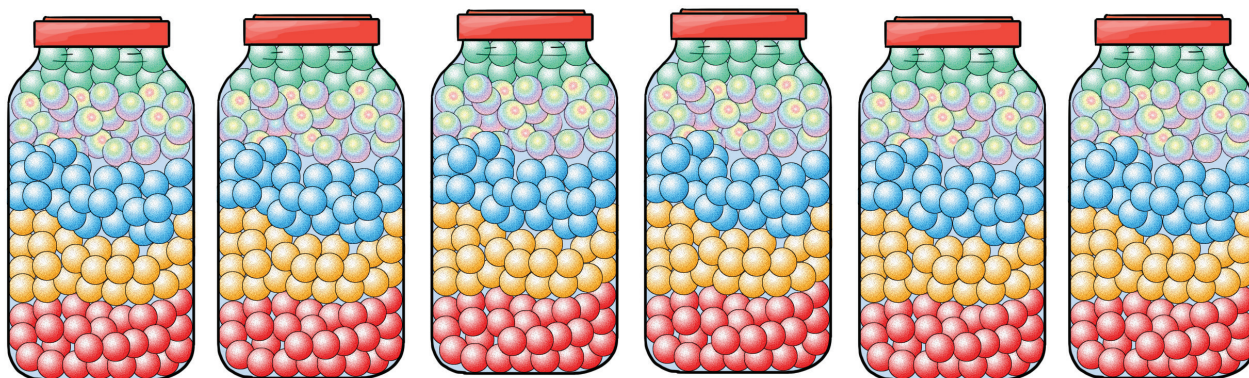


Answer

There will be about 400 sweets in the four jars.

Activity 2

- I. It is estimated that about 100 sweets fill a jar.
Estimate how many sweets are there in the six jars.



2. Look at the poem.

Sweets

Red sweets taste like strawberries
And these are tangerine
Yellow sweets are lemony
But green sweets just taste green

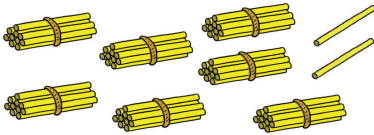
Stripy sweets are liquorice
With sugar in between
White sweets taste of peppermint
But green sweets just taste green

Purple sweets are blackcurrant
So lick the wrapper clean
Brown sweets taste of chocolate
But green sweets just taste green

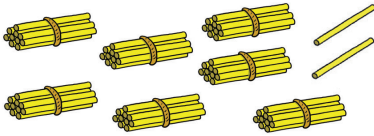
- a) Estimate the number of words in the poem without counting.
- b) Count the number of words in the poem by making groups of 5.
- c) Count the number of words in the poem by making groups of 10.
- d) What would be the quickest way to count the words? Give a reason for your decision.

Example

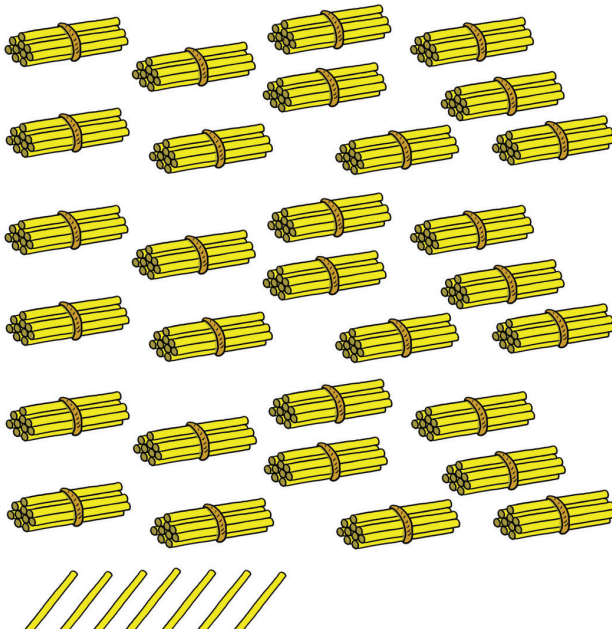
Complete the table

	How many ones?	How many bundles of 10?	How many sticks in total?
			

Answer

	How many ones?	How many bundles of 10?	How many sticks in total?
	2	7	72

3. Complete the table. Do not draw the bundle of sticks.

	How many ones?	How many bundles of 10?	How many sticks in total?
a) 			

b)

--	--	--	--

4. Count the number of sticks and complete the table.
Do not draw the sticks.

	Number of sticks	How many sticks will there be if you add ten more sticks?
a)		
b)		
c)		
d)		

Count forwards and backwards

When you count forwards, the numbers get bigger or greater.

When you count backwards, the numbers get smaller or less.

Example

Start at 460 and count backwards in 4s from 460 to 436.

Answer

460; 456; 452; 448; 444; 440; 436; 432; 428; 424;
420; 416

Example

Look at the sequence of multiples of 4 from 280 to 336.

280	284	288	292	296
300	304	308	312	316
320	324	328	332	336

What number pattern do you notice?

Answer

Multiples of 4 end with 0, 2, 4, 6 and 8.

Take note

Note that all the numbers are even numbers.

Example

Count forwards in 50s from 50 to 800.

Answer

Take note

.....
Note that it is easier to see a pattern if you list the numbers in a table.

50	100	150	200
250	300	350	400
450	500	550	600
650	700	750	800

Activity 3

1. Count forwards in 2s
 - a) 476; 478; _____; _____; _____; 486; _____
 - b) 340; 342; _____; _____; _____; _____; 452
2. Count backwards in 5s
 - a) 200; 195; _____; _____; _____; 175; _____
 - b) 310; 305; _____; _____; _____; _____; 280
3. Count backwards in 4s:
 - a) 500; 496; 492; _____; _____; _____; 486
 - b) 200; 196; 192; _____; _____; _____; 176

4. Complete the table by counting backwards in 5s.

500	495	490	485
480	475	470	465
400	395	390	385

5. Complete the table with the multiples of 3.

90	93	96	99	102
105				
120				
150	153	156	159	162

6. Complete the table by counting backwards in 50s.

1 000	950	900	850	800	750
700					
400					150

7. Complete the table by counting forward in 100s

100	200			
600	700			1 000

Describe, compare and order numbers

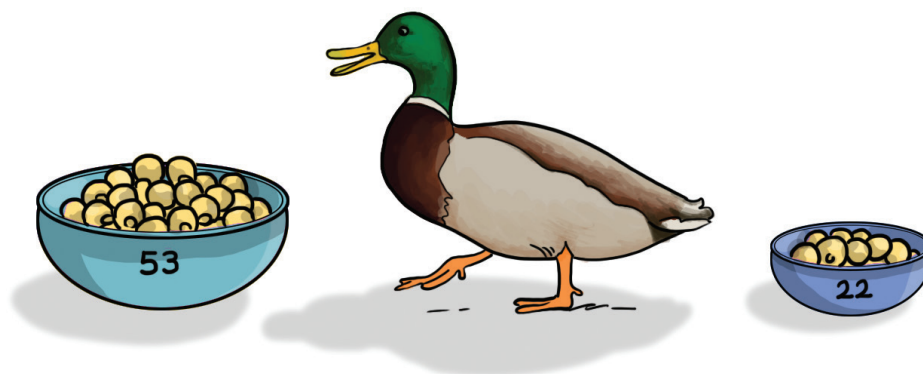
To compare numbers we look at the greatest values and compare them first.

We can use these symbols when we order and compare numbers:

$<$	less than
$>$	greater than
$=$	equal to

Take note

The duck always goes to the bowl that holds the most corn.



We say $53 > 22$ (we say '53 is greater than 22') because the 5 in the tens place is bigger than the 2 in the tens place.

Example

Order the numbers from the smallest to the greatest.
362; 433; 436; 326

Answer

326; 362; 433; 436

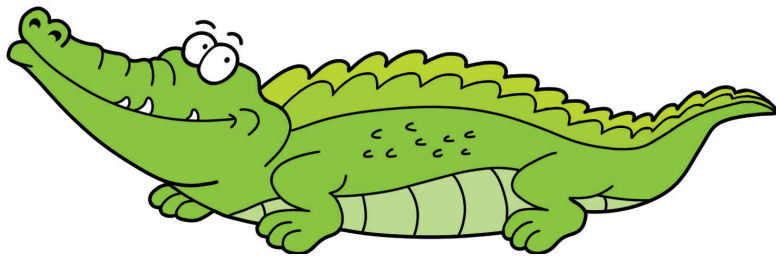
Activity 4

1. Order the numbers from greatest to smallest:
 - a) 331; 381; 303; 308; 318; 330; 342
 - b) 289; 189; 438; 233; 319; 348; 336
 - c) 471; 319; 282; 270; 314; 211; 112
 - d) 53; 78; 2; 91; 23; 99; 79
 - e) 341; 217; 185; 432; 228; 184; 361

2. Order the numbers from smallest to greatest.
 - a) 468; 424; 452; 444; 474; 498; 462
 - b) 262; 228; 298; 265; 273; 282; 500
 - c) 342; 312; 358; 393; 361; 325; 301
 - d) 282; 488; 328; 238; 388; 428; 49
 - e) 512; 488; 585; 432; 328; 238; 89

3. Complete the number sentence by using the correct symbol to make each one true.
 - a) 282 _____ 2 hundreds, 8 tens and 2 ones
 - b) 352 _____ 325
 - c) 225 _____ 125
 - d) 4 hundreds and 5 ones _____ 504
 - e) 382 _____ 238

4. Look at the lengths of some of the longest crocodiles in the world.



Name of Crocodile	Length
Cassius	548 cm
Yai	551 cm
Gustave	750 cm
Brutus	560 cm
Lolong	617 cm
Bujung Senany	588 cm
Dominator	610 cm

- What is the name of the longest crocodile?
- What is the name of the second longest crocodile?
- What is the name of the second shortest crocodile?
- What is the name of the shortest crocodile?
- How many crocodiles are longer than 550 cm?
- Do you agree with the statement: “Dominator, the crocodile, is 7 cm longer than Lolong the crocodile”? Explain why you agree or do not agree.
- Order the lengths of the crocodiles from longest to shortest.

Place value

In this unit you represent 3-digit numbers using place value cards, and write the numbers in words, breaking down and building up into digits. Place value cards can be used to build up numbers.

Example

Look at the number 407 on the place value cards.

H	4	0	0	▶
T				▶
U			7	▶

Answer

We say four hundred and seven.

Example

- Write the number 453 in words.
- Write 453 in expanded notation.

Answer

- $453 = \text{four hundred and fifty-three}$
- $453 = 4 \text{ hundreds} + 5 \text{ tens} + 3 \text{ ones} = 400 + 50 + 3$

Example

- Write the number 368 in words.
- Write 368 in expanded notation.

Answer

- $368 = \text{three hundred and sixty-eight}$
- $368 = 3 \text{ hundreds} + 6 \text{ tens} + 8 \text{ ones} = 300 + 60 + 8$

Example

What is the value of the underlined digit?

465

Answer

The value of the 4 is 400.

Example

What is the value of the underlined digit?

367

Answer

The value of the 6 is 60.

Example



What is the value of the underlined digit?

209

Answer

The value of the 2 is 200.

Look at the value of each digit in these examples.

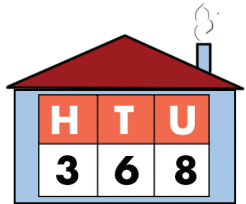
Number	Breaking up the number	Number house
213	= 2 hundreds + 1 ten + 3 ones	 A diagram of a two-story house with a red roof and a chimney on the right. The house is divided into three vertical sections. The top section is labeled 'H' (Hundreds), 'T' (Tens), and 'U' (Ones) from left to right. The bottom section contains the digits '2', '1', and '3' corresponding to the top section.
368	= 3 hundreds + 6 tens + 8 ones	 A diagram of a two-story house with a red roof and a chimney on the right. The house is divided into three vertical sections. The top section is labeled 'H' (Hundreds), 'T' (Tens), and 'U' (Ones) from left to right. The bottom section contains the digits '3', '6', and '8' corresponding to the top section.

Activity 5

1. Complete the table:

	Number symbol	Breaking up the number
E.g.	462	$400 + 60 + 2$
a)		$200 + 70 + 5$
b)		$400 + 30 + 4$
c)	368	
d)	158	
e)		$400 + 40 + 8$
f)		$300 + 60 + 6$
g)	420	$400 + 20$

2. Complete the table:

	Number	Position of each digit	Breaking it up	Number house
E.g.	368	3 hundreds + 6 tens + 8 ones	$300 + 60 + 8$	
a)	443			
b)	347			
c)	290			
d)	404			

3. Complete:

a) $365 = 300 + \square + 5$

b) $328 = 300 + \square + 8$

c) $475 = \square + 70 + 5$

4. Complete the table:

	Position of each digit	Number symbol
E.g.	4 hundred + 7 ones	407
a)	1 hundred + 4 tens	
b)	2 hundred + 4 tens + 6 ones	
c)	3 hundred + 9 tens + 5 ones	
d)	4 hundred + 5 tens + 7 ones	
e)	3 hundred + 9 ones	
f)	4 hundred + 4 ones	

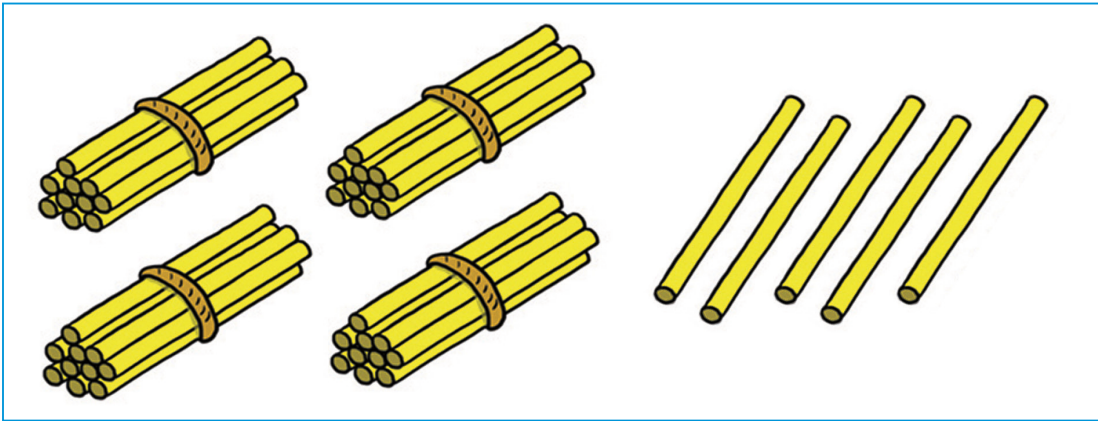
5. Complete:

a) In 453, the value of 5 is _____.

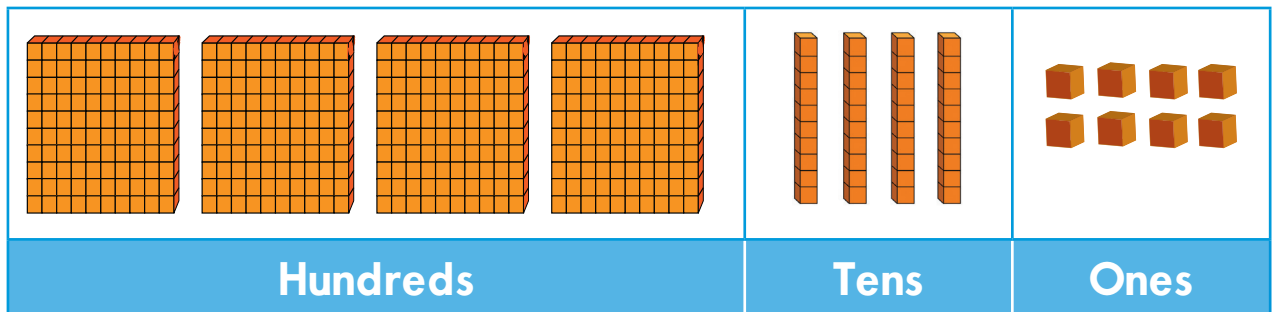
b) In 239, the value of 9 is _____.

c) In 327, the value of 3 is _____.

6. Look at the bundles and loose sticks.


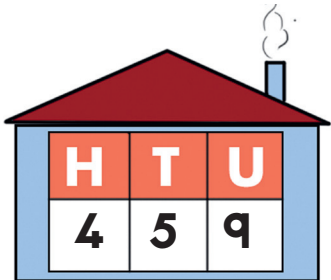
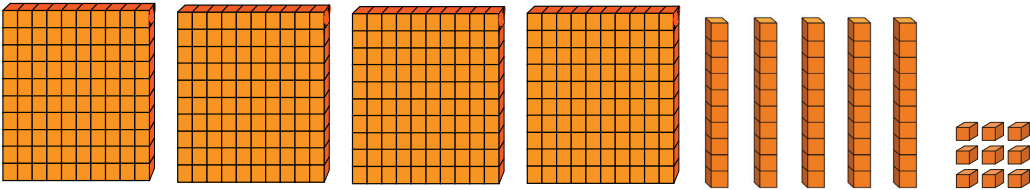


- How many bundles of sticks are there?
 - How many sticks are there in a bundle?
 - How many loose sticks?
 - How many sticks are there altogether?
7. Look at how we can use Dienes blocks to show place value of a number.



- Write the number symbol represented by the Dienes blocks.
 - Write the number name represented by the Dienes blocks.
 - Write the value of each digit.
8. Explain why 440 is greater than 404.
9. Explain why 405 is smaller than 450.

10. Mary's favourite number is 459. Look at how she used her place value knowledge to create a poster about her favourite number.

Mary's favourite number	Broken up	Number house
 = Four hundred and fifty nine	459 = 4 hundreds + 5 tens + 9 units	
The digit 4 in 459 represents 400. The digit 5 in 459 represents 50. The digit 9 in 459 represents 9.		
Visual presentation 		
Take note 10 more than 459 is 469 100 more than 459 is 559 10 fewer than 459 is 449 100 fewer than 459 is 359		

- Choose your favourite number greater than 300 but smaller than 500.
- Create your own poster like Mary's poster.

Addition and subtraction

We can add and subtract three-digit numbers using different methods. One method is to break the number down into smaller parts to make calculations easier. Study the different methods we can use to add and to subtract.

Example

Calculate $325 + 83$.

Answer

Method 1

Add by breaking down one number.

Answer

$$\begin{aligned} 325 + 83 &= \square \\ &= 325 + 80 + 3 \\ &= (325 + 80) + 3 \\ &= 405 + 3 \\ &= 408 \end{aligned}$$

Method 2

Add by breaking down both numbers.

Answer

$$\begin{aligned} 325 + 83 &= \square \\ &= (300 + 20 + 5) + (80 + 3) \\ &= 300 + (20 + 80) + (3 + 5) \\ &= 300 + 100 + 8 \\ &= (300 + 100) + 8 \\ &= 400 + 8 \\ &= 408 \end{aligned}$$

Example

Calculate $389 - 127$

Answer

Method 1

Subtract by breaking down one number.

Answer

$$\begin{aligned} 389 - 127 &= \square \\ &= 389 - (100 + 20 + 7) \\ &= (389 - 100) - (20 + 7) \\ &= 289 - (20 + 7) \\ &= (289 - 20) - (7) \\ &= 269 - 7 \\ &= 262 \end{aligned}$$

Method 2

Subtract by breaking down both numbers.

Answer

$$\begin{aligned} 389 - 127 &= \square \\ &= (300 + 80 + 9) - (100 + 20 + 7) \\ &= (300 - 100) + (80 - 20) + (9 - 7) \\ &= 200 + 60 + 2 \\ &= 262 \end{aligned}$$

Check the answer

$$\begin{aligned} 262 + 127 &= \square \\ &= (200 + 60 + 2) + (100 + 20 + 7) \\ &= (200 + 100) + (60 + 20) + (2 + 7) \\ &= 300 + 80 + 9 = 389 \end{aligned}$$

Example

Calculate $145 + 146$

Answer**Method 1**

Add by identifying near doubles.

Answer

$$\begin{aligned}
 145 + 146 &= \square \\
 &= 145 + (145 + 1) \\
 &= (145 + 145) + 1 \\
 &= (\text{double } 145) + 1 \\
 &= 290 + 1 \\
 &= 291
 \end{aligned}$$

Method 2

Add by breaking down both numbers.

Answer

$$\begin{aligned}
 145 + 146 &= (100 + 40) + 5 + (100 + 40 + 6) \\
 &= (100 + 100) + (40 + 40) + (6 + 5) \\
 &= 100 + 80 + 11 \\
 &= 200 + (80 + 10) + 1 \\
 &= 200 + 90 + 1 \\
 &= 200 + 90 + 1 \\
 &= 291
 \end{aligned}$$

Check by rounding off to the nearest ten

$$145 \rightarrow 150$$

$$146 \rightarrow 150$$

$$291 \rightarrow 290$$

$150 + 150 = 300$ The answer is close to your estimation!

Example

Calculate $388 + 11$

Answer

Method 1

Add by breaking down both numbers.

Answer

$$\begin{aligned} 388 + 11 & \square \\ &= 380 + 8 + 10 + 1 \\ &= (380 + 10) + 8 + 1 \\ &= 390 + 9 \\ &= 399 \end{aligned}$$

Method 2

Add by changing a number to a multiple of ten and then adding.

Answer

$$\begin{aligned} 388 + 11 & \square \\ &= 388 + 10 + 1 \\ &= (388 + 10) + 1 \\ &= 398 + 1 \\ &= 399 \end{aligned}$$

Activity 6

1. Use any two methods to do the following calculations.

a) $436 + 125$	b) $467 + 11$
c) $345 + 346$	d) $488 + 11$
e) $467 + 13$	f) $140 + 141$

2. Use any method to do the following calculations.

a) $298 - 48$	b) $326 - 114$
c) $444 - 203$	d) $298 - 318$
e) $347 - 117$	f) $498 - 489$

3. Create your own problems where you add and subtract three-digit numbers. Use two different methods to solve the problems. Look at the example for your layout:

Three-digit numbers: Addition and subtraction

Created by Sihle

Calculate $263 - 47$

Method 1

Subtract by breaking down number.

Answer

$$263 - 47$$

$$47 \rightarrow 50 \quad (\text{round up by } 3)$$

$$263 - 50 = 213$$

Then add 3 to balance out the three when rounded up.

$$213 + 3 = 216$$

$$\text{Therefore } 263 - 47 = 216$$

Problem-solving techniques

We can use different techniques when solving problems in Mathematics:

- Building up and breaking down numbers
- Doubling and halving
- Number lines
- Rounding off in tens

Steps to follow when solving problems	
Understand	<ul style="list-style-type: none">• Read and reread the problem.• Think about the problem.• Circle the numbers and box the key words.• What is the problem about?• What are you expected to do?
Plan	<ul style="list-style-type: none">• What is the best way to solve the problem?• Which operation should you use?• Choose a strategy.
Do	<ul style="list-style-type: none">• Solve the problem.• Is the Maths correct?
Check	<ul style="list-style-type: none">• Explain the answer.• Does the answer make sense?

Building up and breaking down numbers

Example

Nomsa wants to buy a dress for R263 and a scarf for R29. Nomsa has R300. Will Nomsa have enough money to buy both the items?



Answer

Number sentence: $R263 + R29 = \square$

Decide on the method. Look at the different methods you can choose:

Method 1

Adding by breaking down one number.

Answer

$$\begin{aligned} 263 + 29 \\ &= 263 + 20 + 9 \\ &= (263 + 20) + 9 \\ &= 283 + 9 \\ &= 292 \end{aligned}$$

Method 2

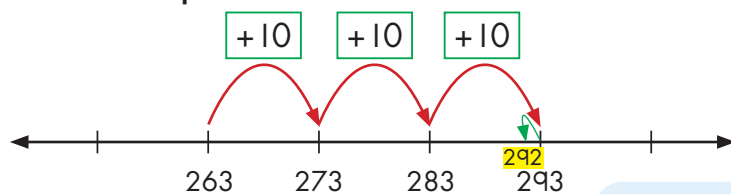
Adding by breaking down both numbers.

Answer

$$\begin{aligned} 263 + 29 \\ &= (200 + 60 + 3) + (20 + 9) \\ &= 200 + (60 + 20) + (3 + 9) \\ &= 200 + 80 + 12 \\ &= 200 + 80 + (10 + 2) \\ &= 200 + (80 + 10) + 2 \\ &= 200 + 90 + 2 \\ &= 292 \end{aligned}$$

Method 3

Use a number line, add a number that's easy to work with and compensate.



29 is close to 30. Start at 263, add 10 three times, and then take away 1.

Answer in a sentence.

Yes, Nomsa does have enough money to buy both items.

Doubling and halving

Example

On Saturday 120 patients were treated at a clinic.
On Sunday 121 patients were treated at the clinic.
How many patients were treated altogether during the weekend?



Answer

Number sentence: $120 + 121 = \square$

The quickest way to solve the problem is to use the doubling technique.

Method 1

Double 120 plus 1
 $= 241$

Method 2

Double 121 minus 1
 $= 241$

Answers

241 patients were treated altogether during the weekend.

Check

$$120 + 120 = 240$$

Round off the numbers to the nearest ten and check if the answer is close to the number you had to find.

Number lines

Example

Calculate the difference between 189 and 35.

Answer

Understand

Read, reread and think about the problem.
Circle the numbers and box the key words.

...calculate the difference between 189 and 35.

Plan

Choose a strategy

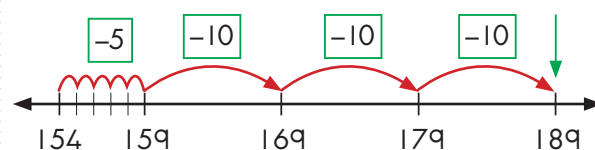
$$189 - 35 = \square$$

Use the jump strategy on a number line to determine the answer.

Do

Solve the problem

Start from 189.
First jump back in tens.
Then jump back in units.



$$189 - 35 = 154$$

Check

Explain the answer

Check the answer by using addition:

$$\begin{aligned} 154 + 35 &= 154 + 30 + 5 \\ &= (154 + 30) + 5 \\ &= 184 + 5 \\ &= 189 \end{aligned}$$

You can also check the answer by starting at 154 on the number line and then:
First jump forward in units.
Then jump forward in tens.

Example

Hazel has R321 and spends R256. How much money does she have left?

Answer

Understand

Read, reread and think about the problem
Circle the numbers and box the key words.

Hazel has R321 and spends R256. How much money does she have left?

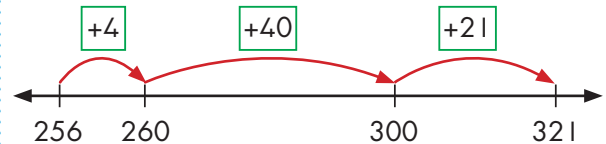
Plan

Choose a strategy

$321 - 256 = \square$
Use the jump strategy on a number line to determine the answer.

Do

Solve the problem



Start at 256 and hop to 260. Then hop to 300 and then hop to 321.

Add the hops:

$$4 + 40 + 21 = 65$$

$$321 - 256 = 65$$

Check**Explain the answer**

Check the answer by using addition:

Add by breaking down both numbers.

$$256 + 65$$

$$= 200 + 50 + 6 + 60 + 5$$

$$= 200 + (50 + 60) + 6 + 5$$

$$= 200 + 110 + 11$$

$$= 200 + (100 + 10) + (10 + 1)$$

$$= (200 + 100) + (10 + 10) + 1$$

$$= 300 + 20 + 1$$

$$= 321$$

Answer in a sentence:

Hazel has R65 left.

Rounding off to the nearest 10

We can also use rounding off to the nearest 10 as a technique when solving problems in Mathematics.

The rule with rounding off is that if a number is exactly halfway between two multiples of 10, you always round up.

How to round off a number to the nearest 10.

Look at the ones digit.

If it is less than five, round the number down by changing the ones digit to zero.

If it is five and more, round the number up by adding one on to the tens digit and changing the ones digit to zero.

Example

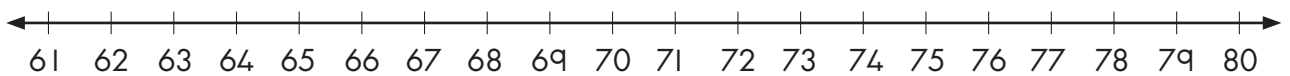
47 rounds up to 50 because the ones digit is 7.

83 rounds down to 80 because the ones digit is 3.

245 rounds up to 250 because the ones digit is a 5.

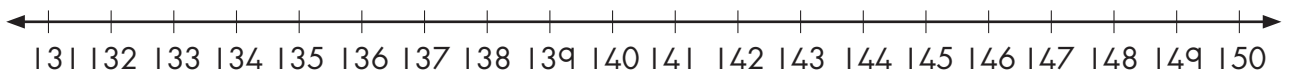
Activity 7

1. Look at the number line.



- a) Is 73 nearer to 70 or 80?
- b) Is 78 nearer to 70 or 80?
- c) Is 75 nearer to 60 or 70?
- d) What number is halfway between 70 and 80?

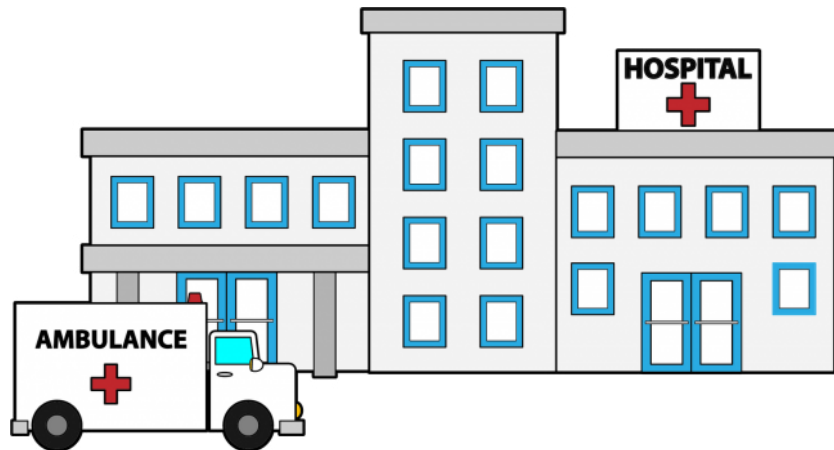
2. Look at the number line.



- a) Is 144 nearer to 140 or 150?
- b) Is 148 nearer to 140 or 150?
- c) Is 145 nearer to 140 or 150?
- d) What number is halfway between 140 and 150?

Use any strategy that you have learned to solve these problems.

3. In one day at the clinic 50 patients were treated. The next day 48 patients were treated. How many patients were treated in these two days?



4. A male lion has a mass of about 190 kg.
A female lion has a mass of about 129 kg.



- a) What is the difference between the mass of the male and the female lion?
- b) What is the mass of the male and the female lion altogether?

5. Themba reads 26 books in November and 47 books in December. How many books did Themba read altogether?



- a) What is the key word in the problem? Which operation are you going to use?
- b) Look at the three different methods we can use to represent $26 + 47$ on a number line.

Method A	Method B	Method c
<p>Number line for Method A: Starts at 26, jumps +10 to 36, +10 to 46, +10 to 56, +10 to 66, and +7 to 73.</p>	<p>Number line for Method B: Starts at 26, jumps +40 to 66, +4 to 70, and +3 to 73.</p>	<p>Number line for Method c: Starts at 47, jumps +20 to 67, +3 to 70, and +3 to 73.</p>

Explain to your friend why and how you can use these three methods to calculate $26 + 47$.

- c) Discuss two different techniques to solve the problem:
 $26 + 47$
 Choose any other technique and solve the problem:
 $26 + 47$
 Explain to your friend why you chose that technique.
- d) How will you check the answer to the problem?
 Explain to your friend why you will check the answer.
 Also explain to your friend why you chose that technique to check the answer.

- e) Thandi wrote as her final sentence:
Themba watched 73 movies in this month.
Explain why Thandi did not answer the question correctly.
Write a correct sentence to answer the problem.

6. Mulaudzi had done 46 sums to prepare for the Maths test on Friday. She then read 20 pages from her favourite book and then did another 33 sums. How many sums did Mulaudzi do in total to prepare for the Maths test?

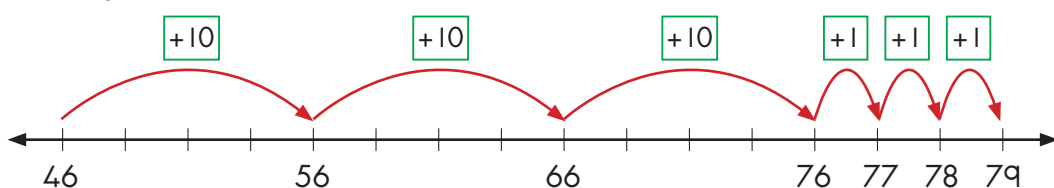


- a) Kgomotso wrote the number sentence to solve the problem as:

$$46 + 20 + 33 = \square$$

Explain why you agree or do not agree with Kgomotso's number sentence.

- b) David used a number line to show a jump strategy for the addition as part of his problem-solving technique for this problem.



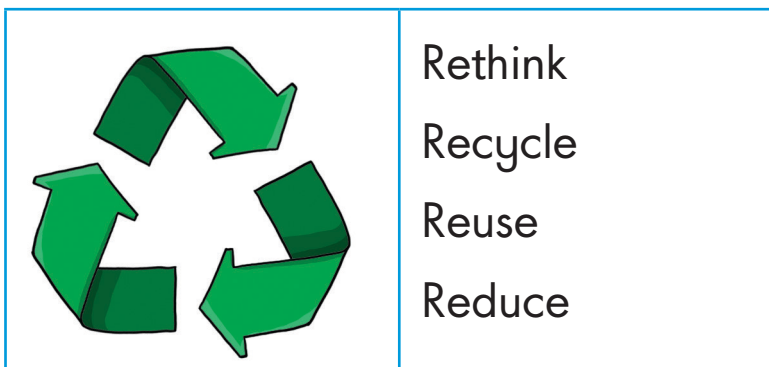
Explain to your friend how to use David's technique to determine $46 + 33$.

- c) Choose any technique to solve the problem of how many sums Mulaudzi had done to prepare for the test. Explain to your friend why you chose that technique.
- d) Write a sentence to answer the problem.
- e) How will you check the answer to the problem? Explain to your friend how you will check the answer.

7. Create three of your own word problems. Use three different problem-solving techniques to solve the problems.

8. A computer game that Caleb wants costs R288. He also wants a toy that costs R111. How much does he need to buy both the game and the toy?

9. Rufus collects items for the school's recycling project. He collected 322 plastic bottles and 478 plastic bags. How many items has he collected altogether?

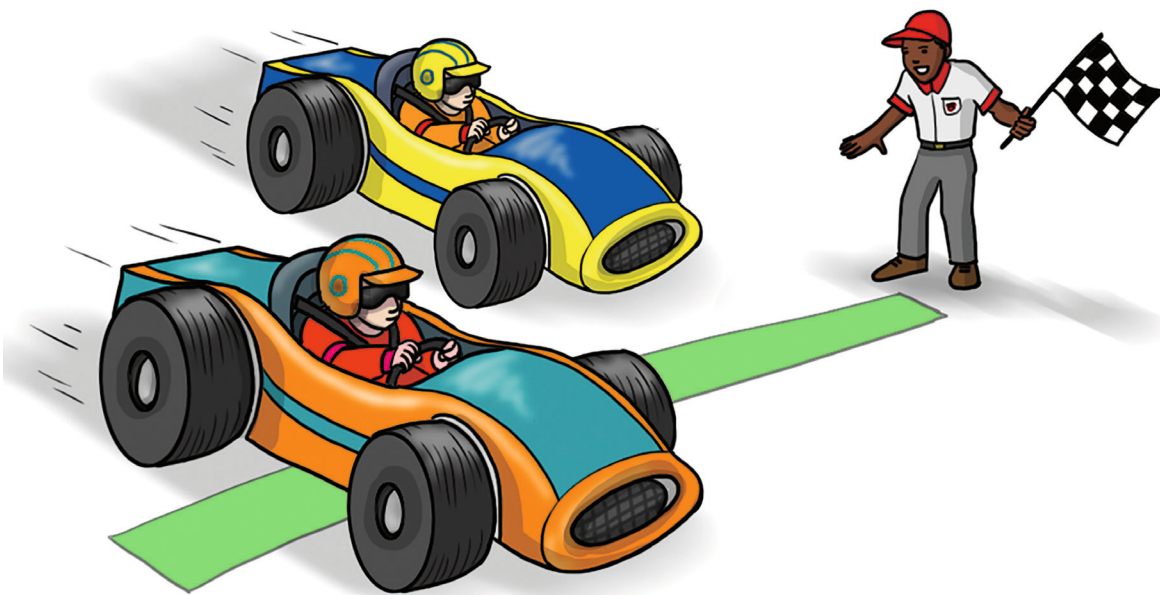


10. A shop has 678 packets of different types of pasta. If 181 packets are macaroni and the rest are spaghetti, how many packets of spaghetti are there?

11. A shop had some ice-creams and ordered 65 more. There are now 565 ice-creams altogether. How many ice-creams were there in the beginning?



12. The tuckshop had 600 chocolates. After selling some chocolates, they had 426 chocolates left. How many chocolates did they sell?
13. A spaza shop had 478 bottles of cooldrink. After selling some bottles, they had 356 bottles of cooldrink left. How many bottles of cooldrink did they sell?
14. Zia earned R330 selling t-shirts and Zola earned R332 selling shorts. How much money did they earn altogether?
15. The orange car travelled at 190 km per hour. The yellow car travelled at 166 km per hour. How much faster was the orange car travelling?

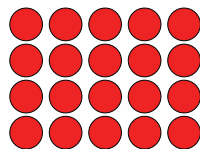


Repeated addition leading to multiplication

There is a connection between multiplication and addition.

Example

Write two addition and two multiplication number sentences for the array:



Answer

Addition number sentences:

$$5 + 5 + 5 + 5 = 20 \quad \text{Count the rows}$$

$$4 + 4 + 4 + 4 + 4 = 20 \quad \text{Count the columns}$$

Multiplication number sentences:

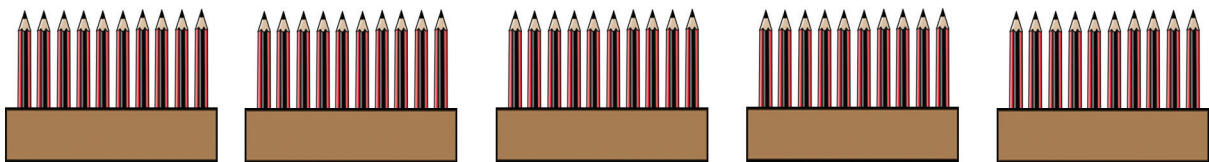
$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

Example

There are 5 boxes of pencils. Each box has 10 pencils.
How many pencils are there in total?

Solve the problem using repeated addition and multiplication



Answer

Repeated addition:

$$10 + 10 + 10 + 10 + 10 = 50$$

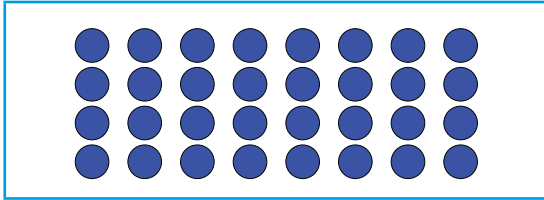
Multiplication:

$$10 \times 5 = 50$$

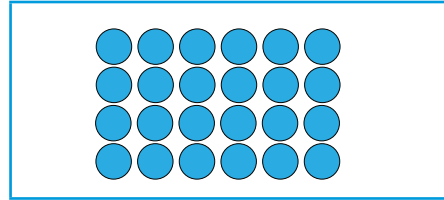
Activity 8

1. Write two addition and two multiplication number sentences for the arrays.

a)



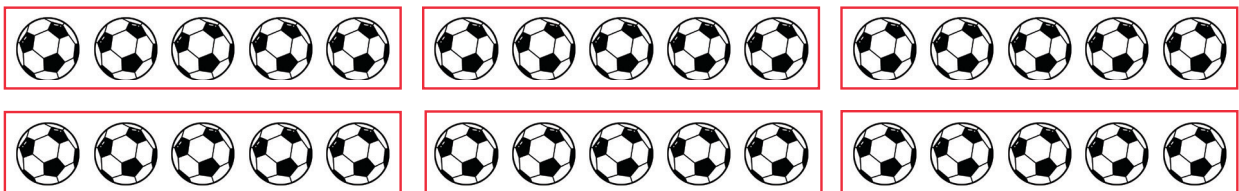
b)



2. There are six cans of cooldrink in a pack.
How many cans are there in four packs?
Solve the problem using repeated addition and multiplication.



3. There are six boxes.
Each box has five balls.
How many balls are there altogether?



Solve the problem using repeated addition and multiplication.

4. Each cake has twelve candles.
How many candles on three cakes?



Solve the problem using repeated addition and multiplication.

5. A vegetable garden has 11 rows of plants. Each row has six plants. How many plants are in the vegetable garden?

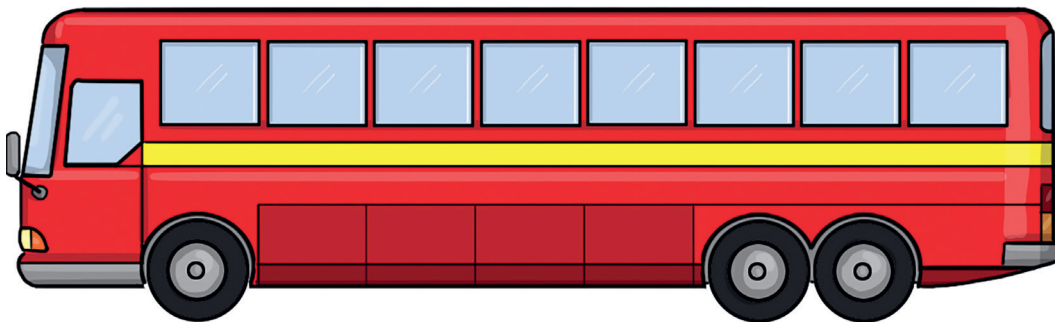
6. A vegetable garden has 45 plants. There are nine plants in each row. How many rows are there?



7. Neo has 6 books. He has three times as many books as Thembi. How many books does Thembi have?



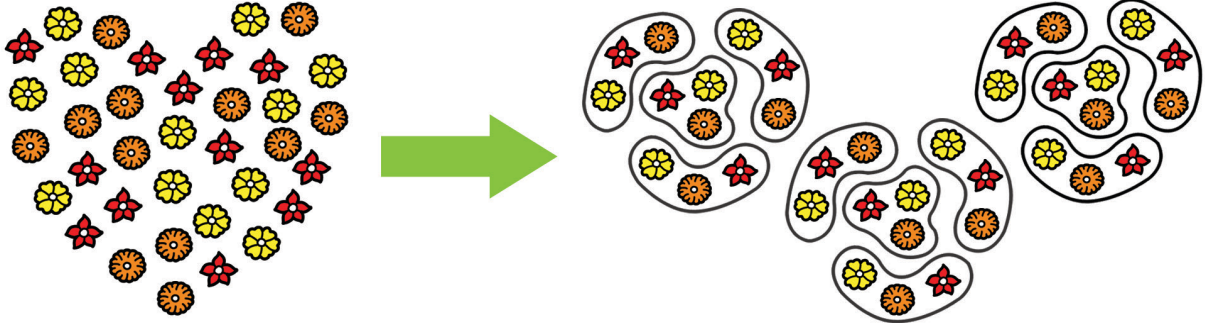
8. Silas has 18 books. His are three times as many books as Pravin's. How many books does Pravin have?
9. Roger must order tyres for seven buses. If each bus has six tyres and a spare wheel, how many tyres must Roger order?



10. A swimming pool is 10 metres long. Chad swims 7 laps. How far did Chad swim?

Grouping and sharing leading to division

Look at the 36 flowers. If we make groups of 3 there will be 12 groups. Mathematically we write $36 \div 3 = 12$



Example

Mandisa wants to share 14 cupcakes equally between herself and three friends. How many cupcakes will each person get?



Answer

Each one will get 3 cupcakes, and there will be 2 cupcakes left.

We write: $14 \div 4 = 3$ remainder 2

Example

There are 31 socks in a drawer. How many pairs of socks are there?

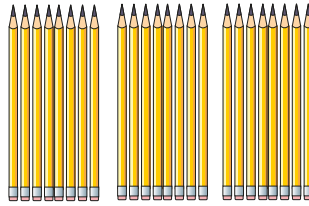


Answer

$31 \div 2 = 15$ remainder 1

Example

Look at the 24 pencils.



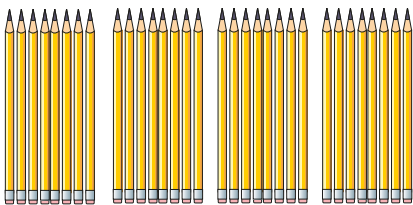
- a) Divide the 24 pencils amongst 3 learners.
- b) Share the 24 pencils amongst 4 learners.
- c) Share the 24 pencils amongst 2 learners.

Answer

- a) $24 \div 3 = 8$ pencils for each learner
- b) $24 \div 4 = 6$ pencils for each learner
- c) $24 \div 2 = 12$ pencils for each learner

Activity 9

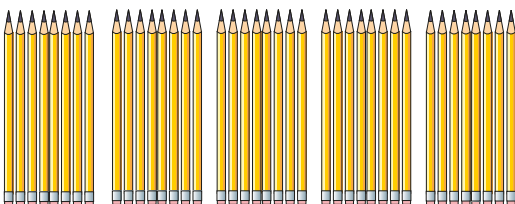
1. Look at the 32 pencils.



- a) Divide the 32 pencils amongst 4 learners.
- b) Share the 32 pencils amongst 2 learners.

2. How many cars are needed to transport 28 learners if four learners can fit into a car?

3. Look at the 40 pencils.

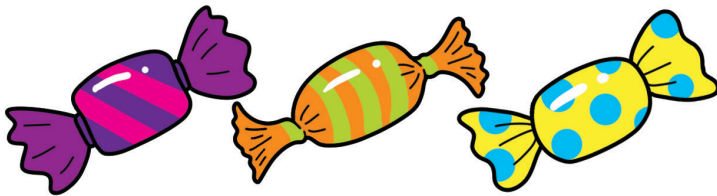


- a) Divide the 40 pencils amongst 4 learners.

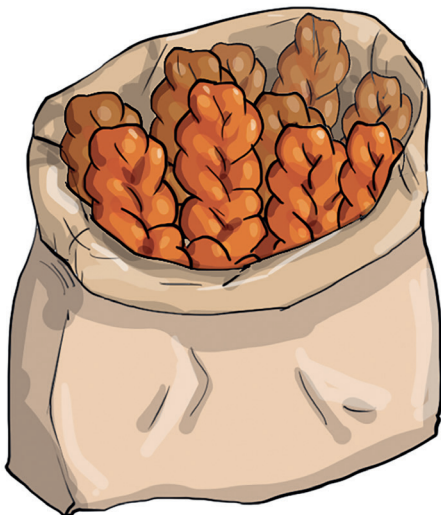
- b) Share the 40 pens amongst 2 learners.
 - c) Share the 40 pens amongst 5 learners.
4. There are 61 socks in a drawer. How many pairs of socks are there?



5. Sihle has 42 sweets. Each day she eats 3 sweets. For how many days can Sihle eat the sweets?



6. How many cars are needed to transport 20 learners if four learners fit into a car?
7. Arlene sells bags with ten koeksusters each. She has 70 koeksusters. How many bags can she fill?



Division

Division means equal sharing and equal grouping.


Division is a shortcut for repeated subtraction.

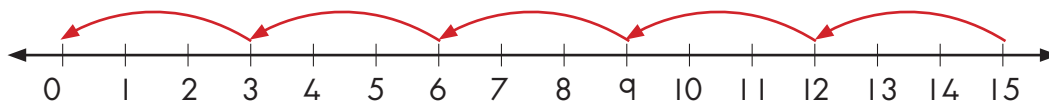
The word division means sharing. We use the \div sign.

Example

- a) Draw a picture that shows how you can share 15 items in equal groups of 3.
- b) Write two number sentences that show how you can share 15 items into equal groups of 3.

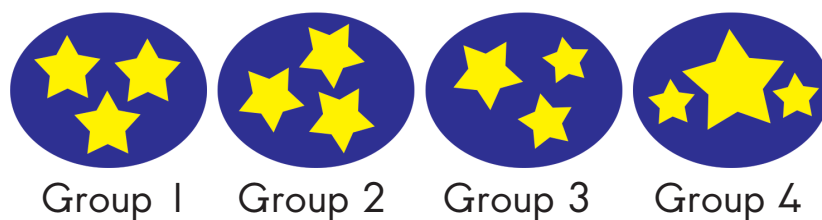
Answer

- a) 
Group 1 Group 2 Group 3 Group 4 Group 5
- b) $15 - 3 - 3 - 3 - 3 - 3 = 0$ repeated subtraction
 $15 \div 3 = 5$ 5 equal groups of 3 with 15 items



Example

Calculate $12 \div 4$ by using repeated subtraction.



There are four groups of 3.

Answer

$$12 - 3 - 3 - 3 - 3 = 0$$

$$12 \div 4 = 3$$

8. Look at the repeated subtraction and count the number of times you subtract. Complete the division number sentence. Write down only the division number sentence.

	Repeated subtraction	Division number sentence
a)	$16 - 4 - 4 - 4 - 4 = 0$	
b)	$24 - 4 - 4 - 4 - 4 - 4 - 4 = 0$	
c)	$30 - 5 - 5 - 5 - 5 - 5 - 5 = 0$	
d)	$14 - 2 - 2 - 2 - 2 - 2 - 2 - 2 = 0$	

9. Complete the following division calculations.

E.g. If $20 \div 4 = 5$, then $20 \div 5 = 4$

a) If $50 \div 10 = 5$, then $50 \div 5 =$

b) If $40 \div 4 = 10$, then $40 \div 10 =$

c) If $8 \div 4 = 2$, then $8 \div 2 =$

10. Look at the picture and write a number sentence using symbols.



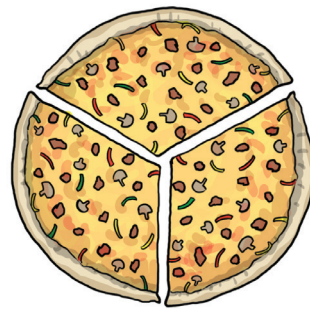
11. Use your own pictures to calculate using grouping.

Sharing leading to fractions

When we share equally we are using division.

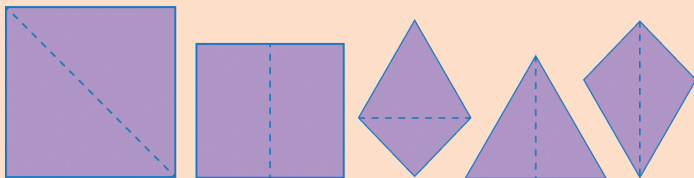
The pizza was cut into three equal parts to share it equally.

We call the three equal parts thirds.



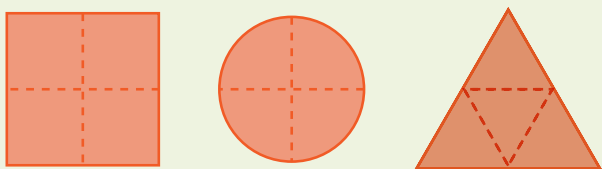
Halves

When we divide a shape into two equal parts, we call each part one half.



Quarters

When we divide a shape into four equal parts, we call each part one quarter or one fourth.

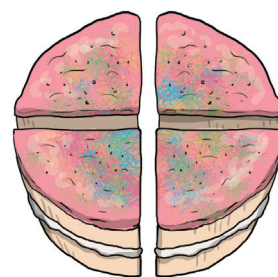


Example

One slice of cake is one quarter of the whole cake.

The whole cake has four quarters.

- Explain why the cake is divided into equal shares.
- You eat one slice of cake. What fraction of the cake did you eat?

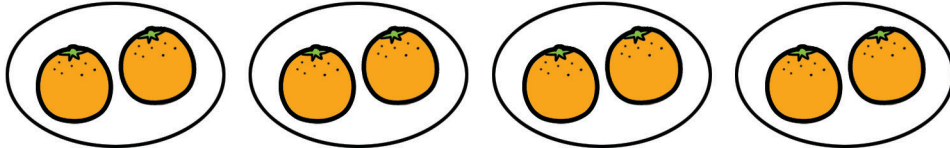


Answer

- a) The cake was shared into 4 equal pieces (quarters).
b) One quarter

Example

Is the set divided into an equal number of objects?

**Answer**

Yes, the set is divided into four equal groups of two oranges each.

Example

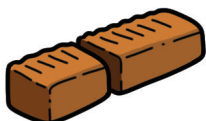
Is the set divided into an equal number of objects?

**Answer**

No, the set is not divided into equal groups.

Activity 10

1. Mimi and Magosi share a bar of chocolate. Which picture shows a fair share? Explain your answer.



A

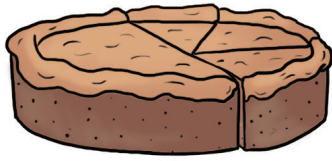


B

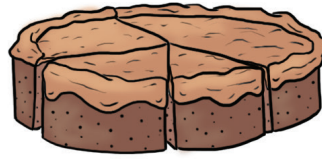


C

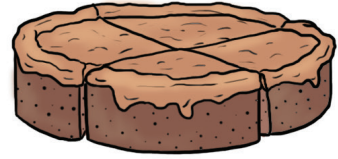
2. Mokgadi, Mimi and Magosi share a cake. Which picture shows equal shares? Explain your answer



A



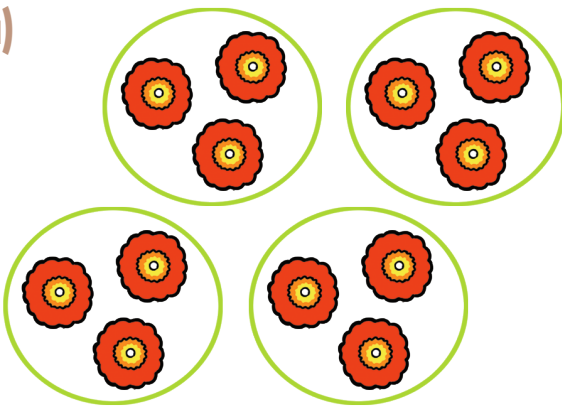
B



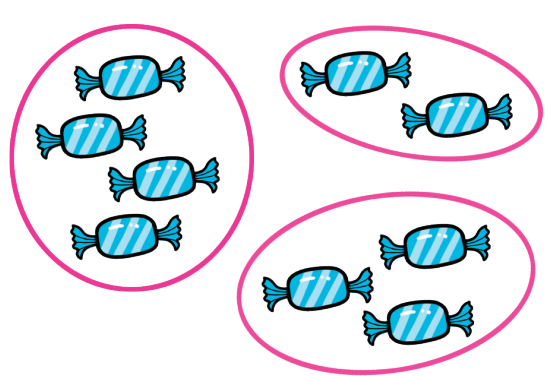
C

3. Is each set divided into an equal number of objects? Write Yes or No.

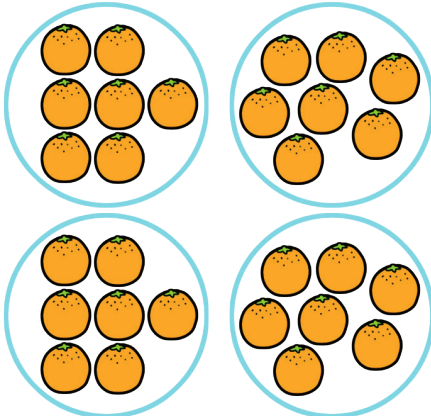
a)



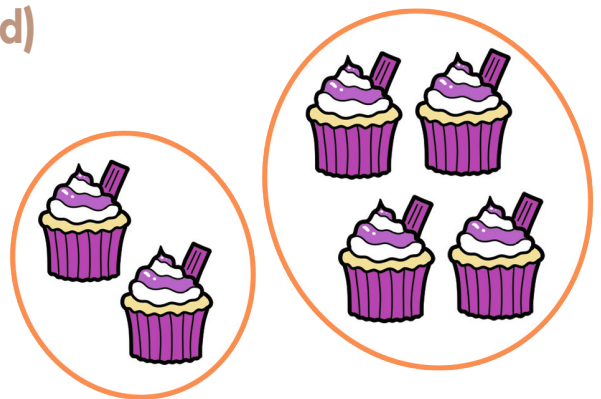
b)



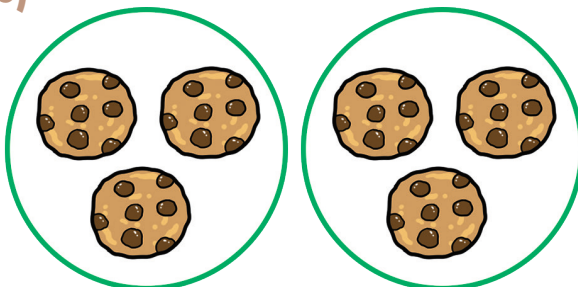
c)



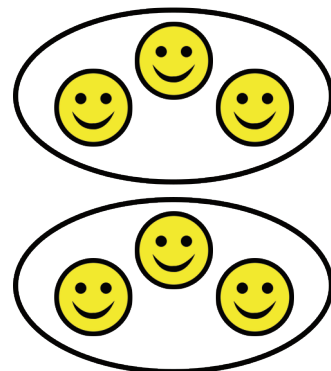
d)





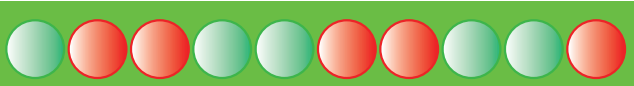




e)



f)



4. Do you agree with the statement? Write yes or no.

a)		One quarter of the circles is red.
b)		One ninth of the circles is red.
c)		One half of the circles is red.
d)		One fifth of the circles is red.
e)		One third of the circles is green.
f)		One half of the circles is green.
g)		One tenth of the circles is green.

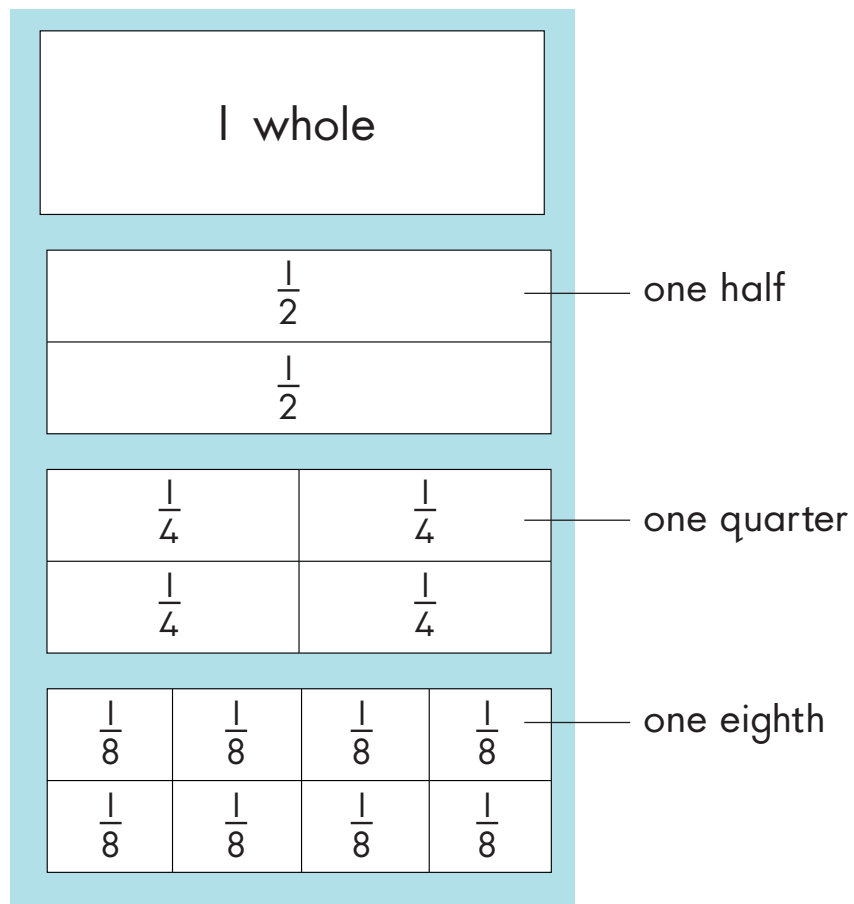
5. Sandile received R18 for his birthday and wants to save a third of the money. How much money will Sandile save?

Fractions

Practical activity

You will need four rectangular sheets of paper.

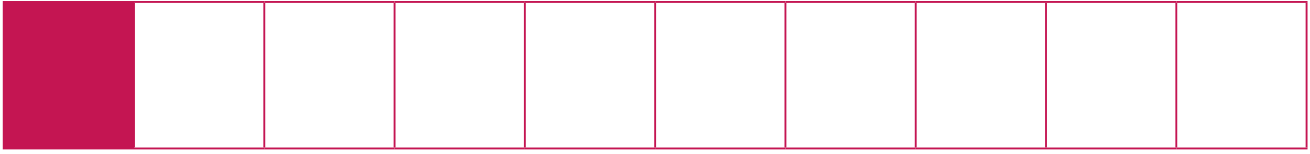
The sheets of paper must all be the same size.



- Write one whole on the first sheet of paper.
- Fold the second piece of paper into two equal parts.
Write half on each part.
- Fold the third piece of paper into four equal parts.
Write one quarter on each part.
- Fold the fourth piece of paper into eight equal parts.
Write one eighth on each part.

Example

Look at the rectangle.



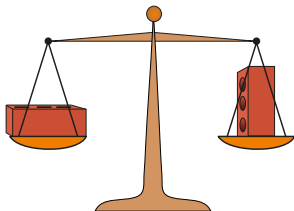
- Write the number of equal parts that the rectangle is divided into.
- Write the fraction that is shaded in words.

Answer

- 10 equal parts
- one tenth

Example

Look at the shape.

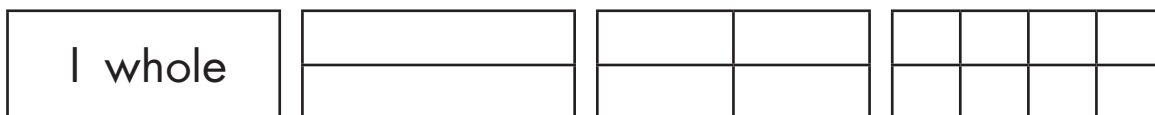


- Write the number of equal parts that the shape is divided into.
- Write the fraction that is shaded in words.

Answer

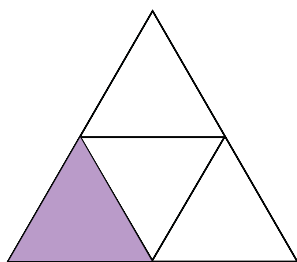
- 5 equal parts
- one fifth

6. Use the fraction pages to answer these questions.



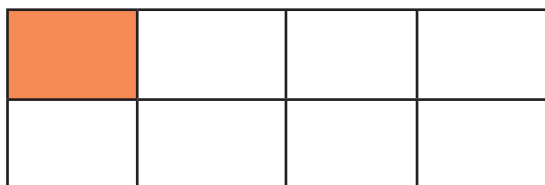
- a) How many halves fit into one whole?
- b) How many quarters fit into one whole?
- c) How many eighths fit into one whole?
- d) How many quarters fit into one half?
- e) How many eighths fit into one half?
- f) Explain why two eighths fit into one quarter.
- g) Discuss why two quarters fit into one half.

7. Look at the triangle.



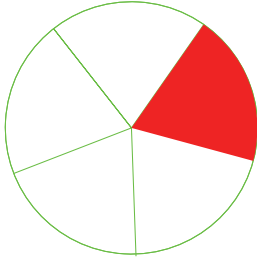
- a) Write the number of equal parts that the triangle is divided into.
- b) Write the fraction that is shaded, in words.

8. Look at the rectangle.



- a) Write the number of equal parts that the rectangle is divided into.
- b) Write the fraction that is shaded, in words.

9. Look at the circle.



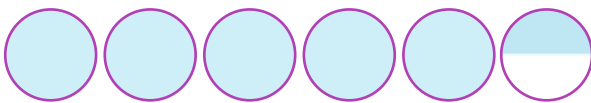
- Write the number of equal parts that the circle is divided into.
- Write the fraction that is shaded, in words.

10. What fraction of each set of apples is circled?

<p>a)</p>	<p>b)</p>	<p>c)</p>
<p>d)</p>	<p>e)</p>	<p>f)</p>

Example

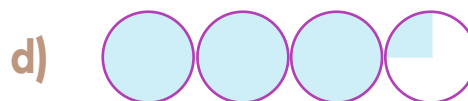
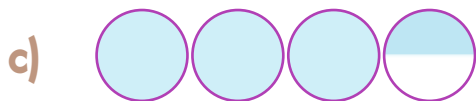
How many of these circles are coloured?



Answer

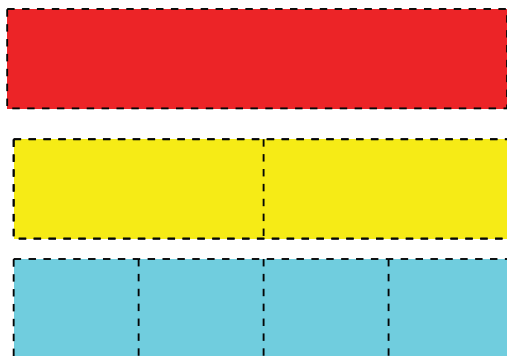
five and a half circles

II. How many of these circles are coloured?



12. Make a fraction wall to order and compare fractions.
You will need three strips of paper of the same length.

- Take the first strip of paper and write one whole on it.
- Take the second strip of paper and fold in half.
- Write half on each part.
- Take the third strip of paper and fold in half and then in half again. Write quarter on each part.
- Shade the strips and stick them into your book.



Take note

The more you divide up the line, the smaller each fraction becomes.

Complete:

- a) There are _____ halves in a whole.
- b) There are _____ quarters in a whole.
- c) There are _____ quarters in a half.
- d) There are _____ thirds in a whole.
- e) There are _____ sixths in a whole.
- f) There are _____ sixths in a third.

Money

It is important for you to be able to work with money.
Here is the money we use in South Africa.

						
10 cents	20 cents	50 cents	1 rand	2 rand	5 rand	10 rand
						
20 rand	50 rand	100 rand	200 rand			

Example





Write 175c as rand and cents.

Answer

$$175c = R1,75$$

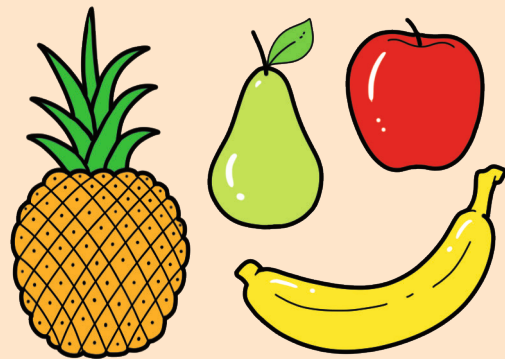
Activity II

I. What is the value of the bank notes and coins?

<p>a)</p> 	<p>b)</p> 
<p>c)</p> 	<p>d)</p> 

2. Mandisa pays R4,50 to take a taxi to school.
- a) How much does it cost Mandisa to get to and from school each day?
 - b) How much does it cost Mandisa to get to and from school each week?
 - c) A weekly return ticket for the train costs R50. Which is cheaper, the train or the taxi?
3. Read this price list and answer the questions that follow.

One pear costs R5,00.
One banana costs R2,50.
One apple costs R3,20.
One pineapple costs R8,00.



- a) How much will you pay for three pineapples?
- b) How much will you pay for four bananas?
- c) How much will you pay for two apples?
- d) How much will you pay for three pears and one pineapple?
- e) You buy three pears. How much change will you get if you pay with a R50-note?

4. Look at the prices at Lucky's tuck shop.

Lucky's tuck shop

Popcorn	R7,50
Vetkoek and mince	R15,00
Ice cream	R11,00
Tea	R5,00
Slice of cake	R12,50

- a) You have R23,00. Write two different items you can buy that will have a total of less than R23,00.
- b) If you buy popcorn and an ice cream, how much will it cost?
- c) If you buy one tea and two ice creams, how much will it cost?
- d) If you buy two slices of cake, how much will it cost?
- e) You buy two slices of cakes and one vetkoek and mince. You pay with a R50 note. Explain why your change will be R10.
- f) Pick any three items you will buy at the tuck shop and calculate the total amount.

Learn about patterns

Geometric patterns

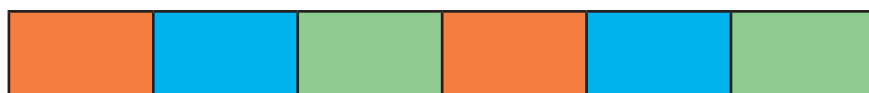
A pattern is the same thing repeated over and over again.

This is a two colour pattern.



We label it A B A B A B

This is a three colour pattern.



We label it A B C A B C

For each pattern, we first identify the first unit, then we label each one with letters of the alphabet.

Activity 12

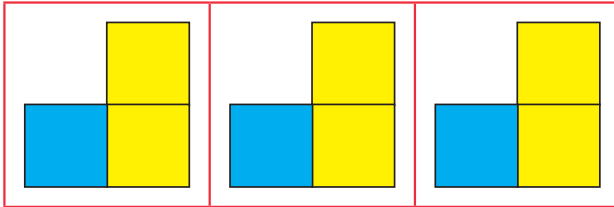
I. Extend each pattern by drawing the next shapes.



We can also use shapes to make different patterns. Look at the example below.

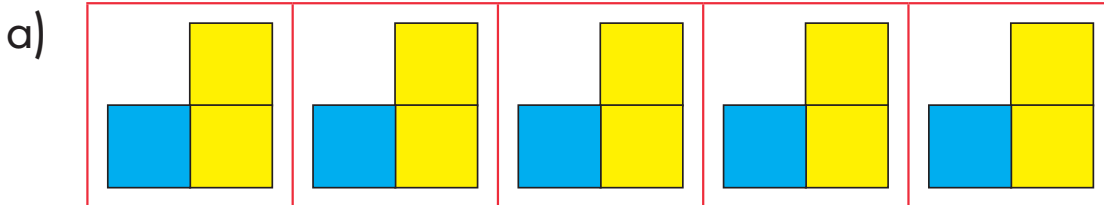
Example

- a) Copy and extend the pattern with two more groups.



- b) Describe the pattern.

Answer



- b) The pattern consists of three squares. One square is blue, and two squares are yellow.

2. Look at each pattern.

- a) Copy and extend the pattern with two more groups.

- b) Describe each pattern.



3. Look at each pattern.

a) Determine which shape is missing.

b) Copy and complete each pattern.



4. This picture shows a traditional hat.



a) Copy the pattern.

b) Describe the pattern to your friend.

3. Come up with a pattern of your own, then ask your friend to describe your pattern.

Number patterns

We can determine a number pattern by finding the rule to get the next number. This term we will learn about growing patterns and decreasing patterns. We will also learn how we can use **tables** to determine an **input** or **output number**.






Remember that a **growing pattern** is a pattern in which the numbers increase each time, for example by addition; whereas a **decreasing pattern** is a pattern in which the numbers decrease each time, for example by subtraction.

Activity 13

1. Work out the pattern rule for each one.

- a)  22  32  42  52  62

Pattern rule: _____

- b)  26  22  18  14  10

Pattern rule: _____

- c)  25  30  35  40  45  50

Pattern rule: _____

- d)  36  31  26  21  16

Pattern rule: _____

- e)  30  28  26  24  22  20

Pattern rule: _____

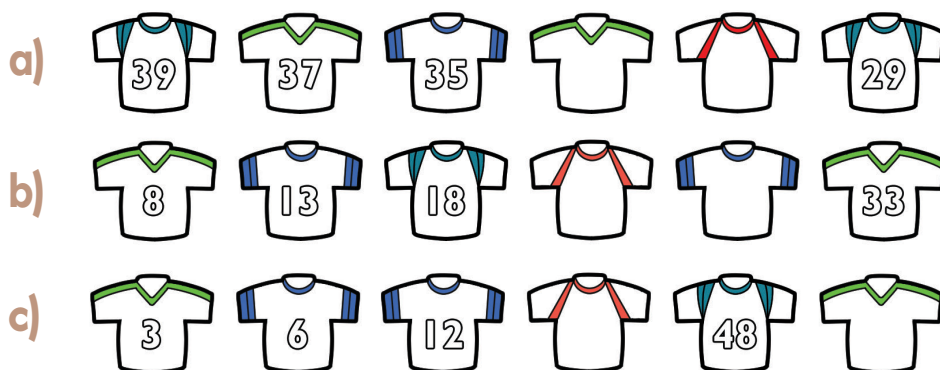
- f)  48  38  28  18  8

Pattern rule: _____

2. Can you finish these patterns?

1 1 3 3 5 5 _____ _____ 9 _____

3. Look at the number symbols on each t-shirt. Find the pattern for each row, then write the missing numbers.

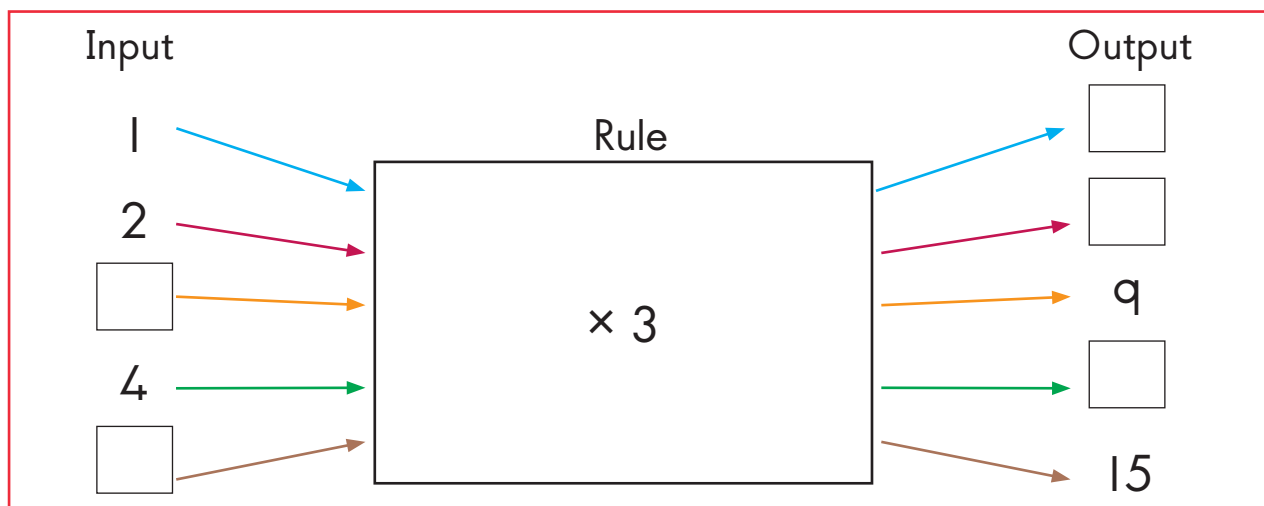


4. Complete the pattern and find the missing number.

26	28	30	32
18	20	22	24
10		14	16
2	4	6	8

What is the pattern?

5. Copy and fill in the missing numbers.



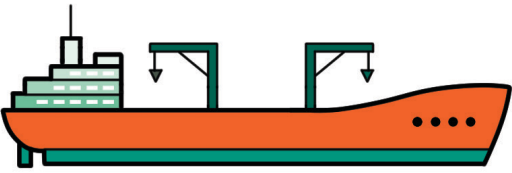

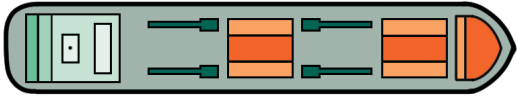
6. Complete the table.

Input	50	51	52	53	55	56	57
Output	150	153	156				

Position and direction


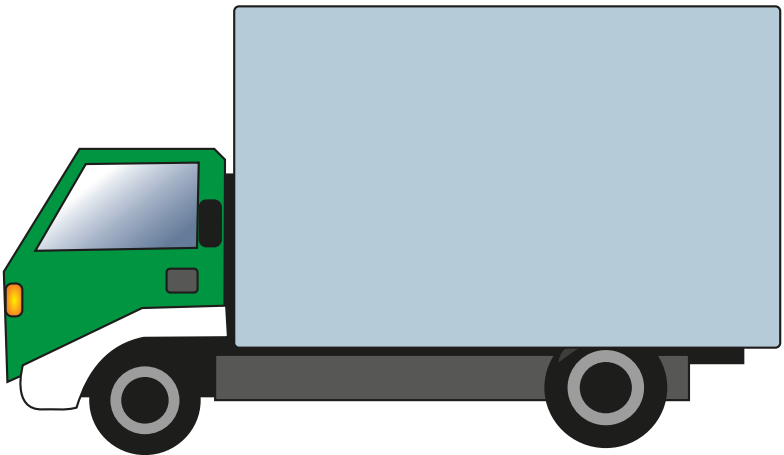
Position

Look at the different views of the ship.

		
Side view	Front view	Top view

Example

Look at the truck.

	
View A	View B

- Is A the front view or the side view?
- Is B the front view or the side view?




Answer

- Front view
- Side view

Activity 14


1. Look at the aeroplane. Match the view with the words in the box.

side	front	top
------	-------	-----

		
View A	View B	View C

- a) View A is the _____ view of the aeroplane.
 b) View B is the _____ view of the aeroplane.
 c) View C is the _____ view of the aeroplane.
2. Look at the truck. Match the view with the words in the box.

side	front	top
------	-------	-----

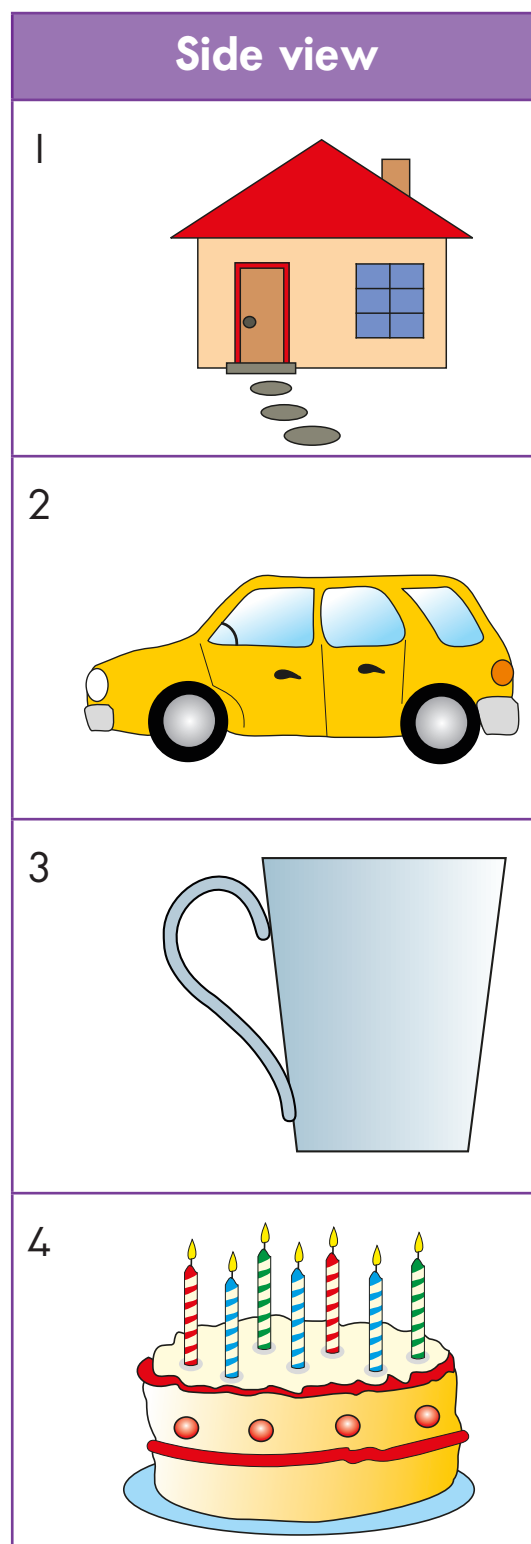
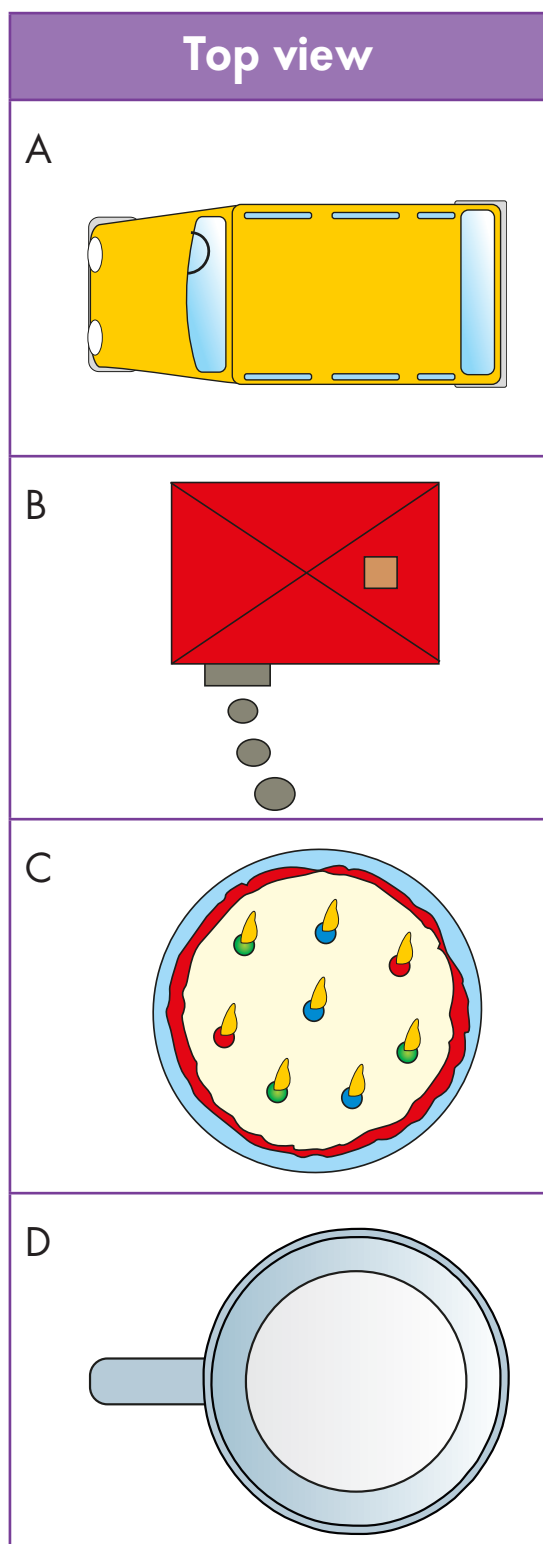
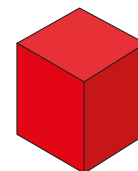
		
View A	View B	View C

- a) View A is the _____ view of the truck.
 b) View B is the _____ view of the truck.
 c) View C is the _____ view of the truck.

3. Match the top view with the side view.

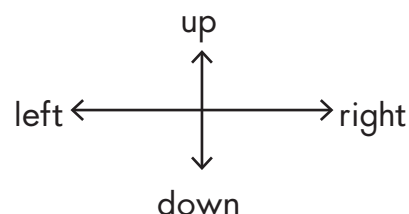
You stand on top of a building and look down.

Name the object, then write the letter and the number for each, example A 2.



Directions

Look at the map of the school.



Map of the school

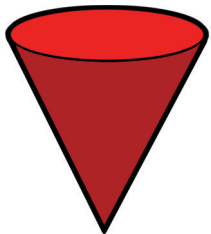
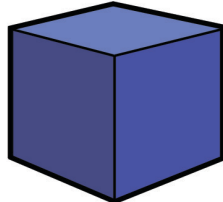

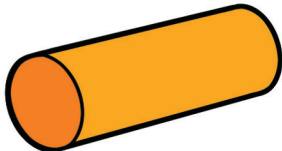
Key	
Office	
Classroom	
Library	
Bathroom	
Tuck shop	
First Aid room	
Meeting place	
Staff room	

- a) How many classrooms are there in the school?
- b) How many bathrooms are there in the school?
- c) Where is the staff room?
- d) Where is the First Aid room?
- e) Give the directions from the library to the tuckshop.
- f) Neo is at the office. Give directions to Neo to go to the tuck shop.
- g) Describe how you would get from the school entrance to the library.

Curved or straight surfaces

Three-dimensional objects take up space and have three dimensions: length, width and height.

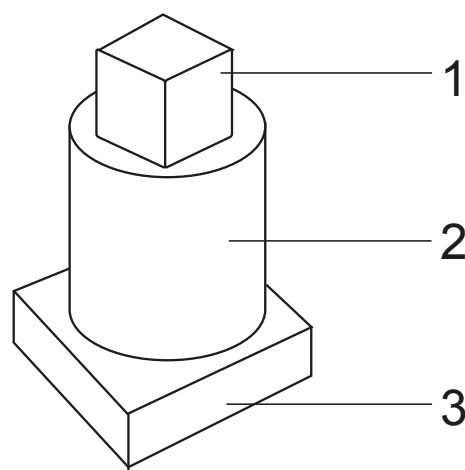
Talk about the pictures of the three-dimensional objects.

Cone	Boxes	Sphere/Balls	Cylinder
			
<ul style="list-style-type: none"> • A circular face. • Curved surface. • Flat surfaces. • Can't stack it. • Can roll it. 	<ul style="list-style-type: none"> • Square or rectangular faces. • Straight sides. • Looks like a box. • Flat surfaces. • Can stack it. • Can slide it. 	<ul style="list-style-type: none"> • Curved surface. • No flat surface. • Looks like a ball. • Can roll it. • Cannot stack it. 	<ul style="list-style-type: none"> • Some sides are flat surfaces and it has a curved surface. • Can roll it. • Can stack it.

Example

Look at the three stacked objects.

- Name each object.
- Explain why we can stack these objects.

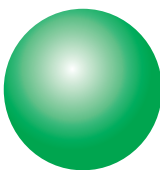
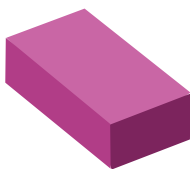

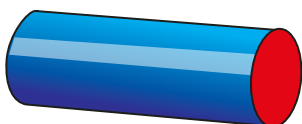


Answer




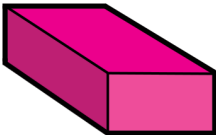
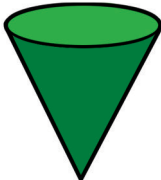
- 1 cube 2 cylinder 3 rectangular prism
- We can stack them because all the objects have flat surfaces.

Activity 15

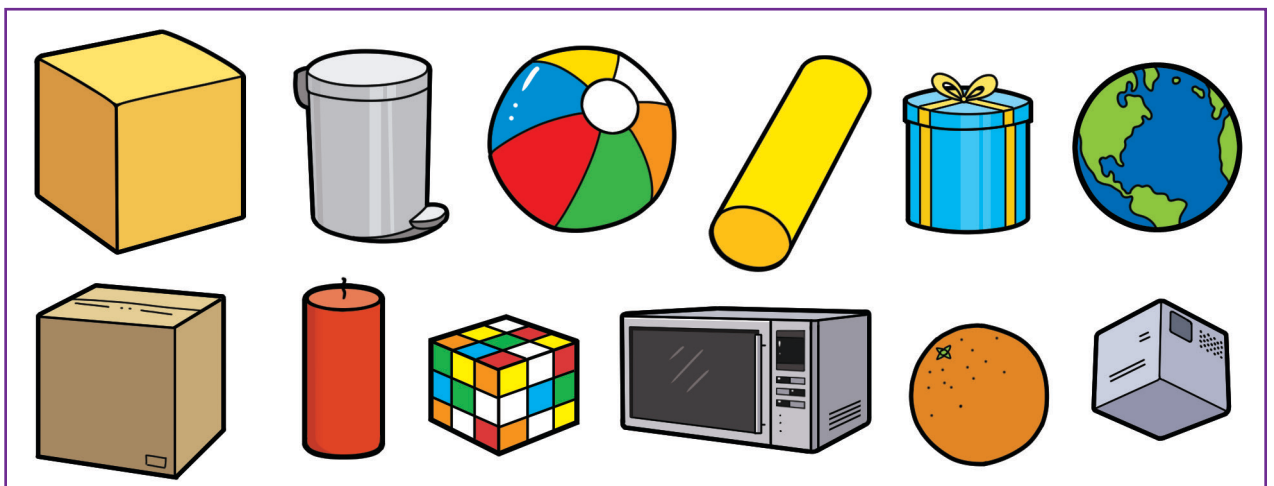
- I. Complete the table. Do not draw the object.

	Objects	Name the object in the picture	Flat surface? Yes or No
a)			
b)			
c)			
d)			

2. Complete the table. Do not draw the object.

	Objects	Name the object	Curved surface? Yes or No
a)			
b)			
c)			
d)			
e)			

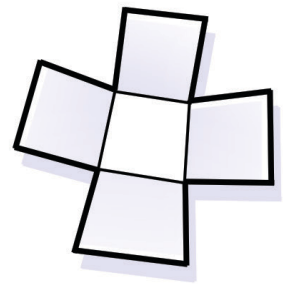
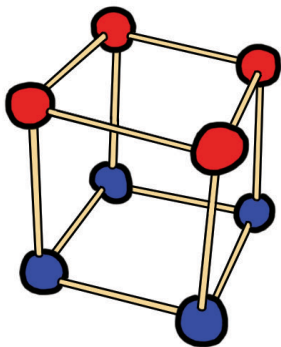
3. Look at the objects below and answer the questions that follow in your classwork book.



- a) How many cylinders are there in the frame?
- b) How many spheres are there in the frame?
- c) How many prisms/boxes are in the frame?
- d) How many of the objects in the frame have only flat surfaces?
- e) How many of the objects in the frame have only curved surfaces?
- f) How many of the objects in the frame have flat and curved surfaces?
- g) Name two objects in the frame that can slide on a floor.
- h) Name two objects in the frame that can roll on a floor.

4. Work in groups:

Use play dough, straws, toothpicks, marshmallows, Prestick. Cut out two-dimensional shapes and build three-dimensional objects. Look at the examples for ideas.



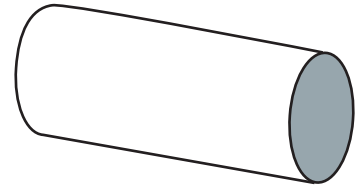
Shape of the faces

The face of a three-dimensional object is the flat surface of the object.

Example

Look at the cylinder.

- a) What shape is the shaded face?
- b) Can this object slide or roll?



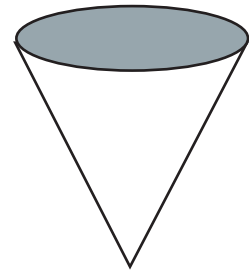
Answer

- a) A circle
- b) both

Example

Look at the cone.

- a) What shape is the shaded face?
- b) Will it slide or roll?



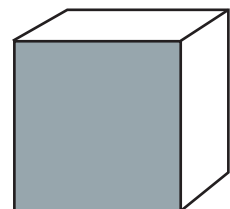
Answer

- a) A circle
- b) both

Example

Look at the prism.

- a) What shape is the shaded face?
- b) Can this object slide or roll?



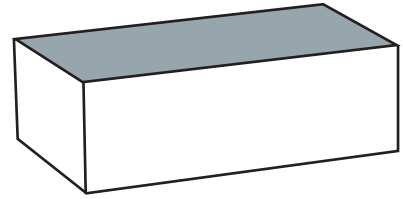
Answer

- a) A square
- b) slide

Example

Look at the prism.

- a) What shape is the shaded face?
- b) Can this object slide or roll?



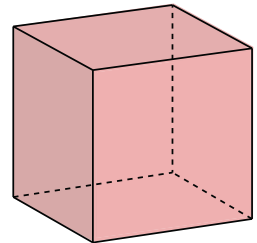
Answer

- a) A rectangle
- b) slide

Activity 16

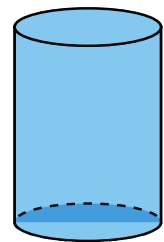
1. Look at the prism.

- a) What shape is the face of the prism?
- b) Thea says this object cannot roll. Is she correct? Explain.



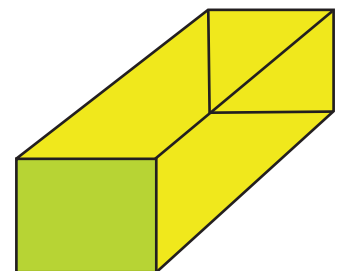
2. Look at the cylinder.

- a) What shape are the top and bottom faces of the cylinder?
- b) Tebogo says this object can slide and roll. Is he correct? Explain.



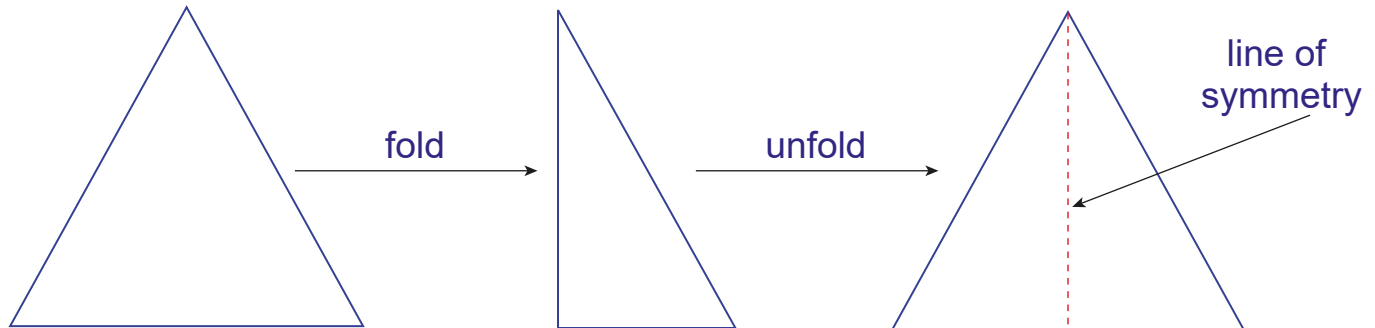
3. Look at this rectangular prism.

- a) What shape is the green face of this prism?
- b) What shape is the yellow face of the prism?



Symmetry

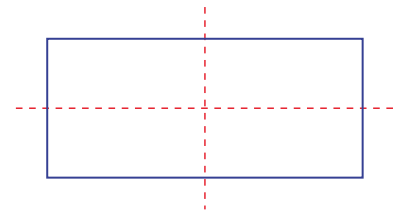
A shape is symmetrical when its two halves are the same along the line of symmetry. Look at this example.



TERM 2

Example

Use a rectangle and fold it to find the lines of symmetry.

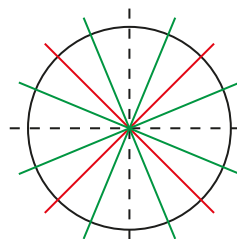


Answer

This rectangle has two lines of symmetry.

Example

Cut out a circle and fold it into halves. Explain why a circle has many lines of symmetry.



Answer

A circle has many lines of symmetry. Every time you change the direction of the fold, you will find a new line of symmetry.

Example

Draw a line of symmetry on the shape.



Answer

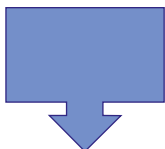


Take note

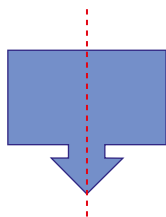
Note that the line of symmetry is from the left to the right.

Example

Draw a line of symmetry on the shape.



Answer

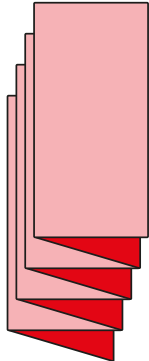
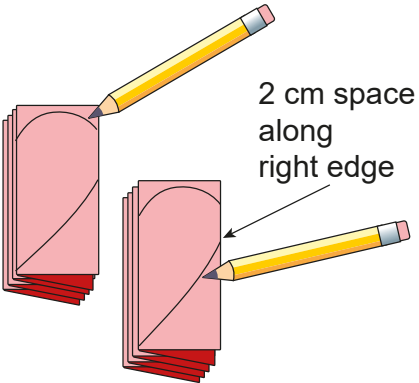
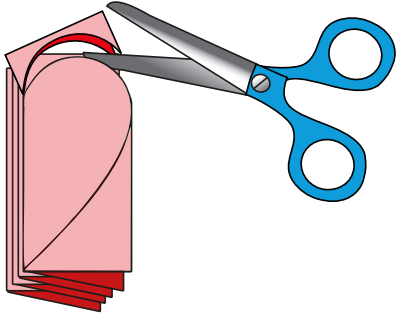



Take note

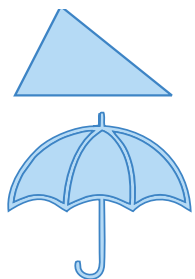
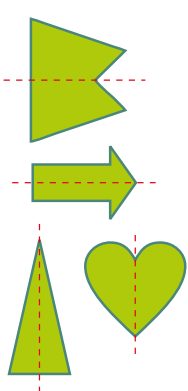
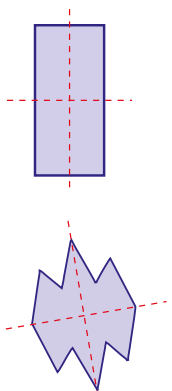
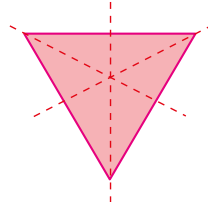
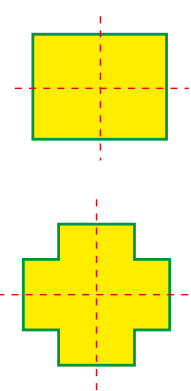

Note that the line of symmetry is from the top to the bottom.

Activity 17

- I. Follow the instructions as shown in the picture of how we can use the line of symmetry to make a chain of hearts through paper folding.

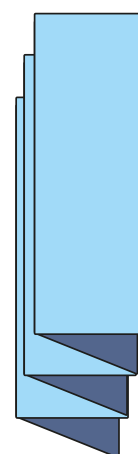
<p>Use an A5 paper. Fold its breadth into 6 rectangles so that it forms a zig-zag pattern like a concertina.</p>	
<p>Draw the top half of the heart then the bottom half, leaving at least 2 cm space along the right edge. The space is where the hearts join to form the chain.</p>	
<p>Hold the folded strip firmly and cut around the heart outline. Use a pair of scissors and cut around the outline – remember not to cut the 2 cm space.</p>	
<p>Unfold the paper strip to reveal your chain of hearts. Stick it in your book.</p>	

2. Cut out at least 10 different shapes and fold them to determine the line of symmetry through paper folding and reflection. Draw the lines of symmetry on the shape. Create a table like the one below and stick the shapes in your classwork book.

No line of symmetry	One line of symmetry	Two lines of symmetry	Three lines of symmetry	Four lines of symmetry	Many lines of symmetry
					

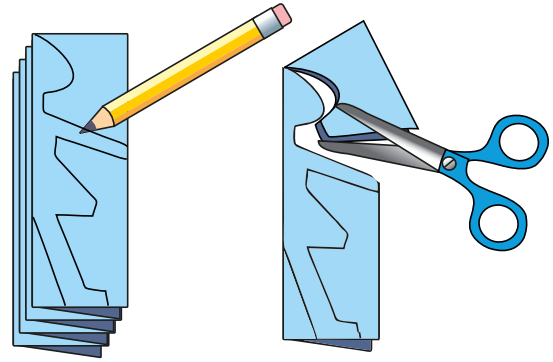
3. Follow the instructions as shown in the diagrams of how we can use the line of symmetry to create a chain of mini-me through paper folding and reflection.

Fold the paper along the dotted lines in a zig-zag pattern like a concertina.



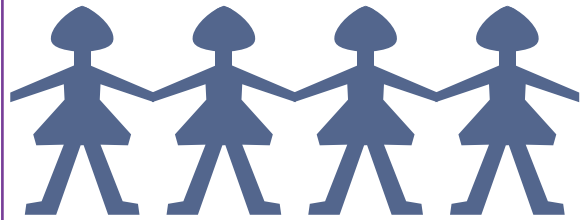
Draw half a figure on the left, folded edge. Draw the arms extending to the edge where you will cut.

Use a scissor and cut around the outline.



Unfold the paper strip to reveal your chain of children.

Decorate it and stick it in your book. You can make the figures boys or girls.

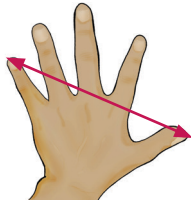


4. Create your own symmetrical shape with a line of symmetry by following these steps:
 - a) Fold a piece of paper into half along the centre.
 - b) Spill drops of ink or paint on one half of the sheet to create a pattern.
 - c) Gently press both the halves together and rub all around the folded paper.
 - d) This will give you a symmetrical shape. The fold of the paper is the line of symmetry.
Draw the dotted line of symmetry on the shape.
5. Repeat the process as described in number 4 to create a symmetrical shape with a horizontal line of symmetry.

Length, width and height

We can measure length using measures such as a handspan.

This is a handspan.

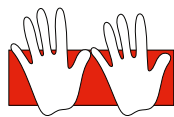


Below is a demonstration of how you can measure the length of bars of different lengths using a handspan as a unit of measurement.

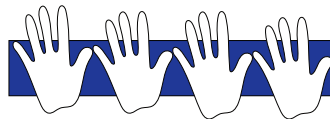
Activity 18

- I. Say if you agree or do not agree with the statement below. Explain your answer.
 - a) The blue bar is shorter than the red bar.
 - b) The red bar is shorter than the blue bar.
 - c) The red bar is longer than the blue bar.

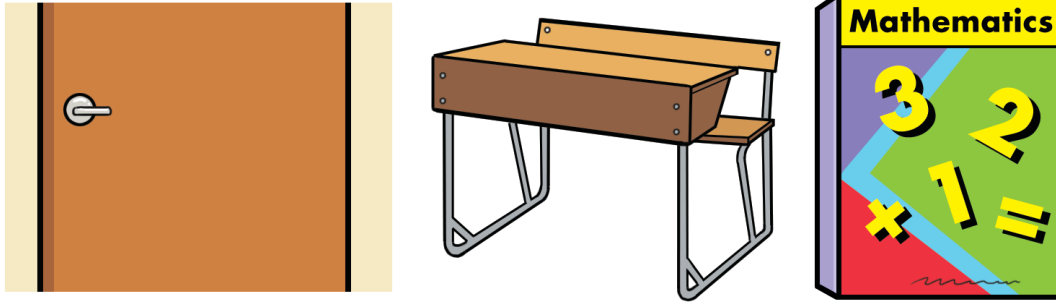
The length of the red bar is 2 handspans long.



The length of the blue bar is 4 handspans long.



We can measure the lengths of objects such as the width of the classroom door, the height of the desk, or the width of a textbook using measures such as a handspan, a pencil, or counters.



2. First make an estimation of how many handspans for each of the following statements.

Check your estimation by taking actual measurements using your handspan.

	Measure	Estimate	Measurement
a)	The width of the desk		
b)	The length of the desk		
c)	The height of the desk		
d)	The width of the classroom door		
e)	The width of the Maths book		
f)	The height of the teacher's chair.		
g)	The height from the floor to the light switch.		

3. Which is wider?

- The classroom door, or the desk? Explain.
- The desk, or the Maths textbook? Explain.

4. Which is taller?

- a) The desk, or the teacher's chair?
- b) The height from the floor to the light switch, or the teacher's chair?

You will need a piece of string or a metre ruler to do the activity below.

5. Estimate first then measure to see if the objects are longer or shorter than a metre.

	Measure	I estimate			I measured
		Longer than a metre	Shorter than a metre	Equal to a metre	
a)	Your height				
b)	The height of your desk				
c)	The width of the window				
d)	The length of your desk				
e)	The length of your exercise book				
f)	The length of your pencil case				
g)	The width of the classroom door				

Work with time

Reading digital time

Activity 19

1. What time is it?

a)



b)



c)



d)



e)



f)



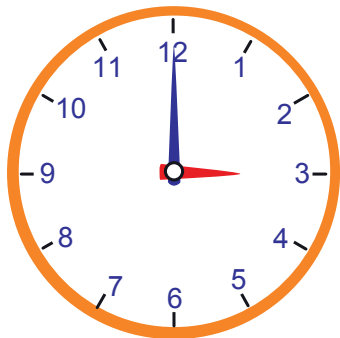
We can calculate the length and passing of time in hours using clocks.

Example

Mabel's mother has an appointment with the dentist. It is scheduled at 3 o'clock in the afternoon and will last for an hour. At what time will the appointment end?

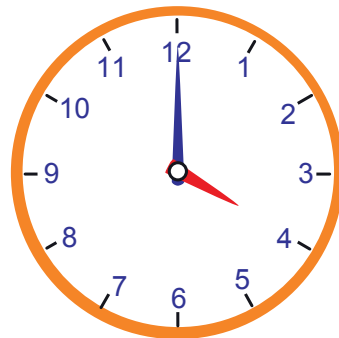
Answer

Start of the appointment



1 hour later

Appointment ends



The appointment will end at 4 o'clock.

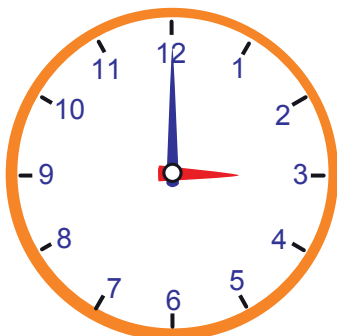
Example

Tod and Jack started playing cricket at 3 o'clock in the afternoon. They finished playing at 5 o'clock the same afternoon.

For how long did they play cricket?

Answer

Starting time



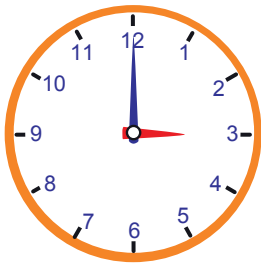
How long?

Finishing time



From 3 o'clock to 4 o'clock is 1 hour.

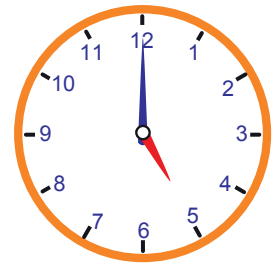
From 4 o'clock to 5 o'clock is 1 hour



1 hour



1 hour



Tod and Jack played cricket for 2 hours.

Activity 20

- I. These clocks shows 10 o'clock.

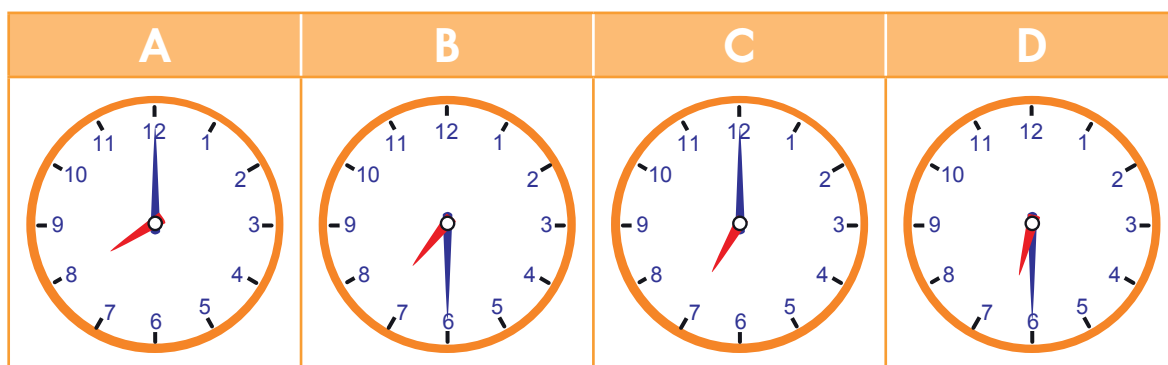


Draw clock faces and show the following:

	On an analogue clock	On a digital clock
a) An hour before 10 o'clock.		
b) An hour after 10 o'clock.		
c) 5 hours before 10 o'clock.		
d) 2 hours after 10 o'clock.		

2. Kwanele leaves for school at 7 o'clock. Jayendra leaves for school half an hour later than Kwanele.

a) Which clock shows when Jayendra leaves for school? Explain your reasoning.



- b) Draw a digital clock showing the time Jayendra leaves for school.
3. Bombisani started studying for a test at 5 o'clock in the afternoon. She finished at 6 o'clock the same afternoon. For how long did Bombisani study?
4. Fanisa watched television from 1 o'clock in the afternoon until 4 o'clock in the afternoon. For how long did Fanisa watch television?
5. How many hours is it?

From	5 o'clock in the morning	3 o'clock in the afternoon	7 o'clock in the morning
To	9 o'clock in the morning	6 o'clock in the afternoon	7 o'clock in the evening
Hours			

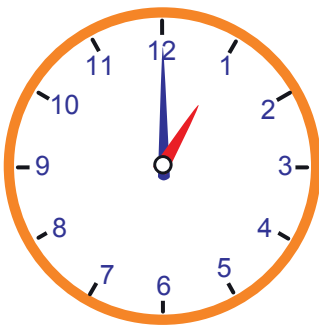
Example

Kananelo took a nap for half an hour at 2 o'clock in the afternoon. At what time did he wake up?

Answer

Kananelo woke up at half past 2 in the afternoon.

6. The school break starts at 10 o'clock and is half an hour long. At what time does the break end?
7. Unathi went to visit her friend Caitlin. She left home at 1 o'clock. If she travelled for 30 minutes, write down the time she arrived at Caitlin's house.
8. These two clocks may help you to answer the questions that follow.



Draw clock faces and show the following:

	On an analogue clock	On a digital clock
a) Half an hour before 1 o'clock		
b) Half an hour after 1 o'clock		
c) Half an hour after half past 1		
d) Half an hour before half past 1		

Calculating length of time and passing of time in days, weeks and months

There are 7 days in a week.

There are 4 weeks in a month.

Activity 21

1. Complete the table below:

Number of days	7	14	21	28
Number of weeks	1			

2. Complete the table below

Number of weeks	4	8	12	16
Number of months	1			

This is the calendar for March 2018. On the calendar, 21 March 2018 is shaded in yellow.

A week passes from 14 March 2018 to 21 March 2018.

March						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

- a) What is the date two weeks before 21 March 2018?
- b) What is the date three weeks before 21 March 2018?
- c) What is special about the 21 March?

3. a) Ben 10's birthday is on 3 April. His friend's birthday is 4 days later. On what day of the week will it be?

April						
S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

- b) Njabulo borrowed a book from the library on 9 April 2018. He can keep the book for a month. On what date must the book be returned?
- c) If Njabulo returns the book on 2 May 2018, for how long was the book with him?
- d) How long is the period from 22 April to 28 April 2018?

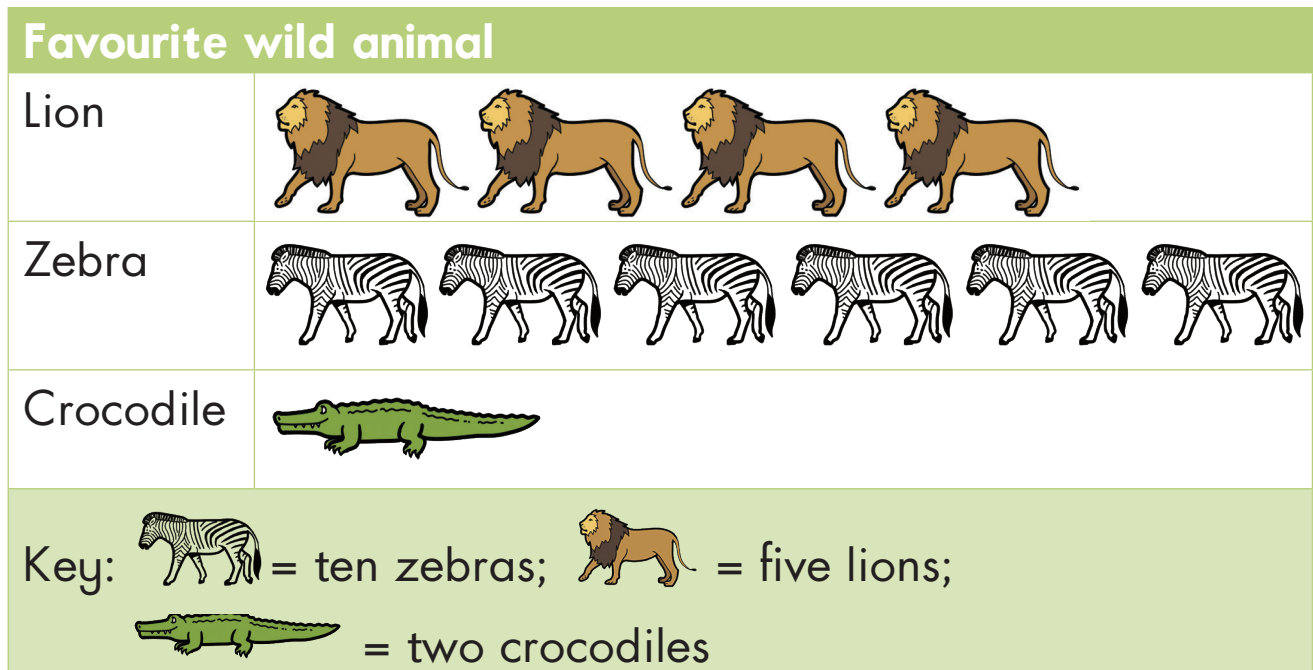


Analysing data

After collecting data, we can organise and the represent it. Afterwards we can analyse the data to answer questions about it.

Example

Kalinka does a survey about the favourite wild animal of a group of learners in her grade. She organises the data in a pictograph.



- Use the pictograph to create a bar graph of the data.
- What animal is the most liked by the learners?
- What animal is liked the least by the learners?
- How many fewer lions than zebras are liked by the learners?
- How many learners chose zebras or lions as their favourite wild animal?

Answer

a)

Favourite wild animal				
Number of learners	70			
	60			
	50			
	40			
	30			
	20			
	10			
		Lion	Zebra	Crocodile
Type of animal				

- b) The zebra is the most liked animal.
 c) The crocodile is the least liked animal.
 d) 40 lions
 e) 82 learners

Activity 22

1. Thabo asked 20 learners in his class about their favourite food.

He listed their answers in this table.

pizza	hamburger	pizza	pizza	samoosas
salad	samoosas	hamburger	salad	salad
hamburger	hamburger	pizza	pizza	samoosas
pizza	pizza	samoosas	salad	hamburger

Organise the data Thabo collected by completing the tally table.

Favourite food		
	Tally	Frequency
Salad		
Pizza		
Hamburger		
Samoosas		

2. Use the information from the tally table to represent the data on the bar graph.


Number of learners	Favourite food			
	7			
	6			
	5			
	4			
	3			
	2			
	1			
	Pizza	Salad	Samoosas	Hamburger
Types of food				

3. Analyse the data represented in the bar graph by answering the following questions:
- What food is the most popular?
 - What food is the second most popular?
 - How many learners chose salad and samoosas as their favourite food?


Example

The number of customers at a supermarket in Mafikeng for one week were recorded as follows:






























Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
500	200	400	300	350	500	600

- Draw a pictograph to show this information.
Use  to represent 100 customers.
- On how many days where there more than 400 customers at the supermarket?
- How many customers visited the supermarket on Monday and Tuesday?

Answer

Every 100 customers is represented by  .
For Sunday there are 500 customers. So, you need 5 symbols.

a)

Day	Frequency	Total
Sunday	    	500
Monday	 	200
Tuesday	   	400
Wednesday	  	300
Thursday	  	350
Friday	    	500
Saturday	     	600
	Represents 100 customers	

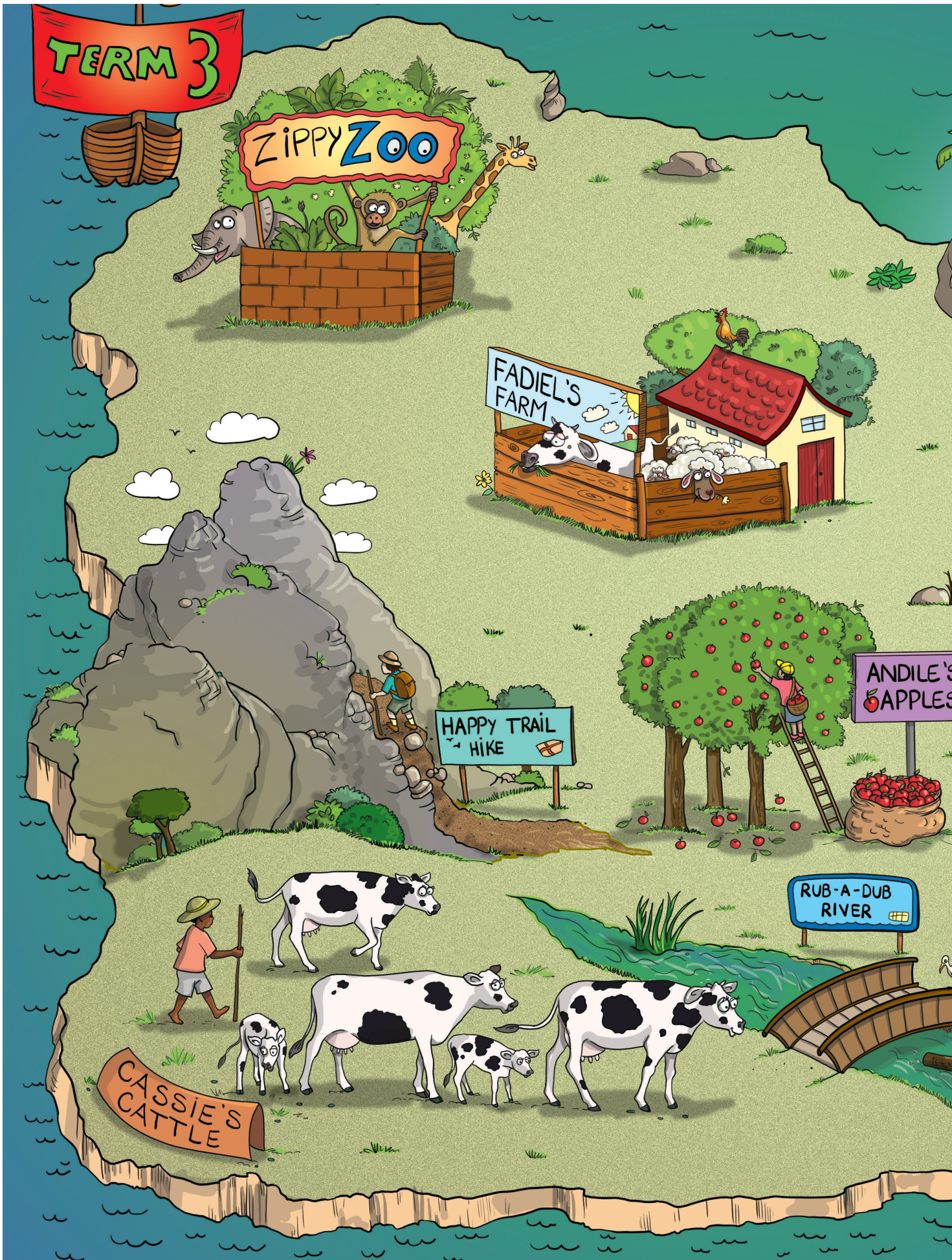
- On three days there were more than 400 customers.
- $200 + 400 = 600$
600 customers visited the supermarket on Monday and Tuesday.

4. The pictograph shows the number of learners in a class who take part in different sport activities.

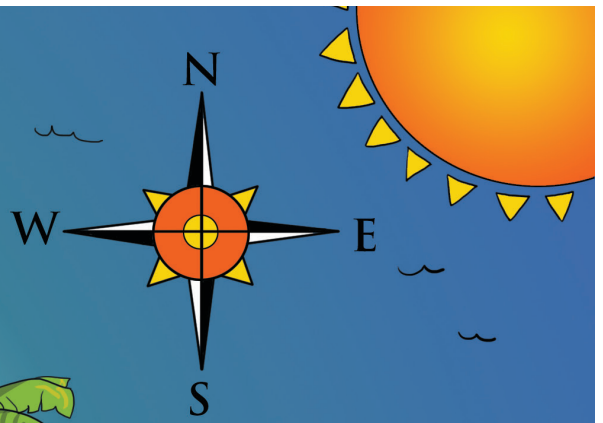
☺ Represents 2 learners

Number of learners	☺			
	☺	☺		
	☺	☺	☺	☺
	☺	☺	☺	☺
	☺	☺	☺	☺
	Soccer	Athletics	Netball	Hockey
Key: ☺ = 2 learners				

- Which sport is mostly played by the learners?
 - How many learners do athletics and netball?
 - How many learners played hockey?
 - What is the difference between number of learners playing soccer and the number of learners doing athletics?
 - How many learners in total take part in the different sports activities?
5. Do your own survey to collect data about the favourite food of the learners in your class. Choose any four types of food. Organise the data in a tally table and draw a bar graph.
6. Analyse the data by writing two questions.



1, 2, 3... we've come so far.
Almost there, as we journey
on to Term 4!



Number names and number symbols from 0 to 500

Let's practise writing number names.

Example

Write the number name for 499.

Answer

Four hundred and ninety-nine.

Activity 1

1. Write the number names for the number symbols.

a) 137

b) 242

c) 386

d) 493

2. a) Work with a friend and write the correct number name next to the correct number symbol.

72	
165	
229	
257	
384	
446	
481	

b) Order the numbers from greatest to smallest.

3. Write the number name and number symbol for each number you find in this story.

One, two, three, four... I don't want to sneeze anymore!

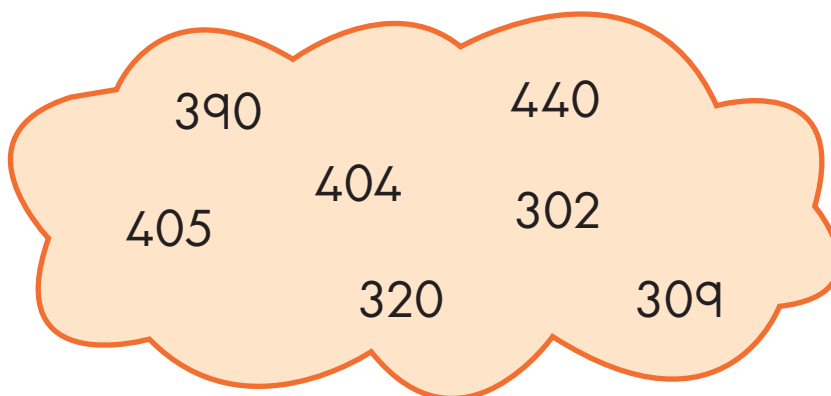
I wish I had a fish, for every time I sneeze and sneeze.

One hundred and eighty days so far, these tickles in my nose won't go away...

How many more of these three hundred and sixty-five days should I endure?



4. Look at the numbers and answer the questions that follow.



- a) Write the number names of the numbers greater than 302 but smaller than 390.
- b) Write the number name of the greatest number in the cloud.
- c) Write the number name of the number with the place value of 4 hundreds + 4 units.

Counting objects

Make groups to count big numbers

When we count bigger numbers, we group them to count. This makes it easier to count.

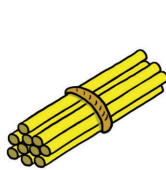
Example

Sandile estimates that there are 100 toys on a shelf at the supermarket. How many toys are there on 5 shelves?

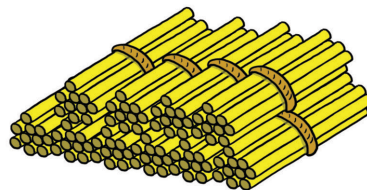
Answer

There are approximately 500 toys on 5 shelves.

Look at the counting sticks below.



This bundle shows 10



This bundle shows 100



This shows 1

Activity 2

1. Read the story. Count the number of words by making groups of 10.

T-rex was a big dinosaur who loved eating meaty treats.

Do you know he was as tall as a building

and as long as three trucks standing side by side?

Can you imagine standing next to a monster so tall?

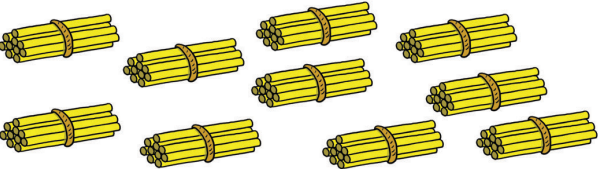
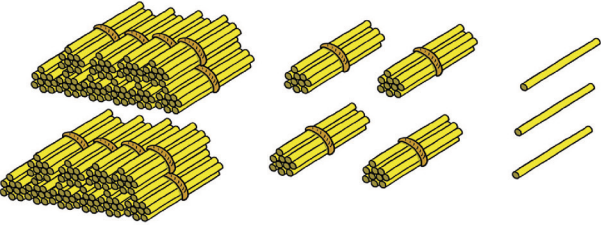
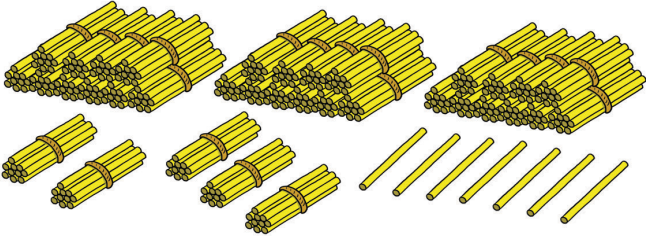
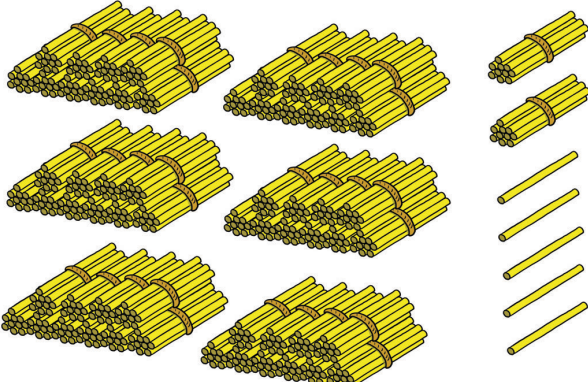
His teeth were as long as a ruler, and ruled!

He lived a long time ago... he must be old!

Other dinosaurs would run away when they heard his roar!!

We use counting sticks to help us count big numbers.

2. Copy and complete the table. Count how many there are.
(Do not draw the bundles.)

Counting sticks	How many groups?	Write the number
a) 	10 groups of 10s	100
b) 	2 groups of 100s 4 groups of 10s 3 ones	
c) 		
d) 		

3. Work with a partner. You can use the 500-number grid to do the following questions.

- a) Count in 20s. Start from 20 and count to 500.
b) Count in 25s. Start from 25 and count to 500.

- c) Count in 50s. Start from 50 and count to 500.
- d) Count in 100s. Start from 100 and count to 500.

Counting backwards and forwards

Counting by grouping is a much more efficient and faster way to count.

This term we will learn to count up to 700. We will continue skip counting in 20s, 25s, 50s and 100s.

Example

Count backwards from 700 to 600 in 25s and list the numbers.

Answer

700; 675; 650; 625; 600

4. Copy and complete by counting forwards in 20s:

310	330		370		410
430		470		510	
	570		610		650

5. Copy and complete by counting forwards in 25s:

	300	325		375	400
425		475		525	
	600		650		700

6. Complete these number sequences.

a) 592; 582; 572; ; ; 542;

b) 475; 495; 515; ; ; 575;

c) 400; 450; 500; 550; ; ;

7. Copy and complete by counting forwards in 50s:

	100	150		250	
350			500		600

8. Copy and complete by counting backwards in 100s:

600		400		200	
-----	--	-----	--	-----	--

9. Fill in the missing numbers.

a) 576; 578; 580; ; 584; ; 588

b) 784; 785; 786; ; 788; ; 790

c) ; 874; 875; 876; 877; ; 879

d) 900; ; 902; ; 904; 905; 906

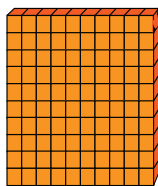
10. Count in 10s from 426 to 496

a) Which digits changed?

b) Which digits did not change?

Counting to 700

We also use Dienes blocks to show numbers.



This shows 100



This shows 10



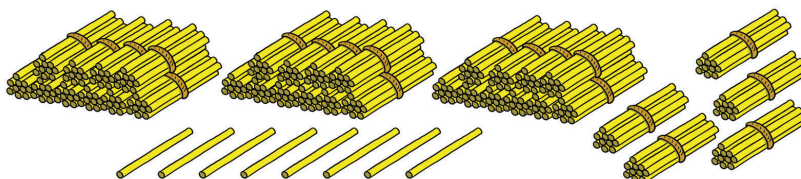
This shows one

Counting objects by breaking numbers into groups of 10s, 20s, 50s and even 100s, helps us to solve problems easily.

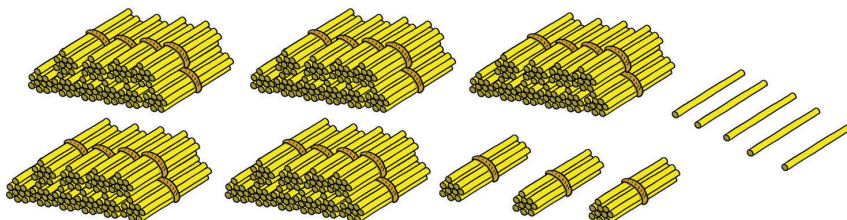
Activity 3

I. What number is shown? Write the number.

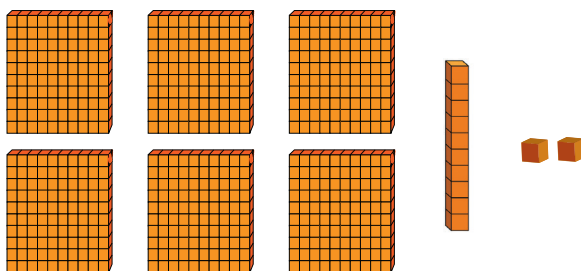
a)



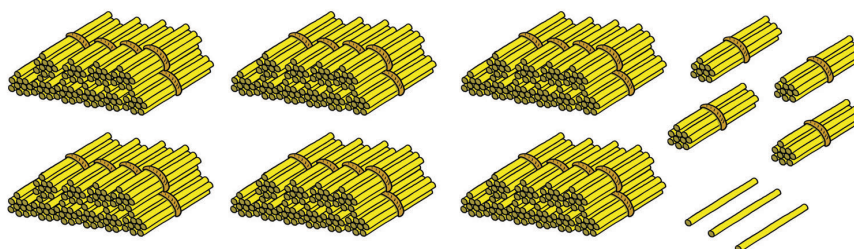
b)



c)



d)



2. What number symbols are they made up of?
Write the number name.

Example

$481 = 400 + 80 + 1$ Four hundred and eighty-one

- | | |
|--------|--------|
| a) 187 | b) 243 |
| c) 351 | d) 476 |

3. Write the number symbols for all the number names you can find in this story.

The frumpy old witch, counted back from one hundred. She could not wait for her broth to cook so that she could feed all four hundred and seventy-five people and turn them all into frogs! Ninety-nine, ninety-eight, ninety-seven...

But the clever children knew what she was up to and came up with a plan... All they needed was four-hundred and thirty-four more seconds! They counted down the minutes... ten, nine, eight... and waited just long enough. They knew she would open her pot – just one big push and in she fell!

4. Count from the given numbers and write the numbers in your classwork book.
- 100s from 300 to 500. Write the numbers.
 - 20s from 375 to 525. Write the numbers
 - 25s from 0 to 250. Write the numbers.
 - 50s from 300 to 0. Write the numbers.

Describe, compare and order numbers

We use words such as **smaller than**, **greater than**, **less than**, and **is equal to** when we compare numbers.

Example

Use these words to make each statement true.

smaller than

greater than

less than

is equal to

- a) 278 is _____ 279
- b) 285 _____ 2 hundreds 8 tens and 5 units
- c) 478 is _____ 378

Answer

- a) less than
- b) is equal to
- c) greater than

Activity 4

I. Use these words to make each statement true.

smaller than

greater than

less than

is equal to

- a) 241 is _____ 387
- b) 412 _____ 4 hundreds 1 ten and 2 units
- c) 452 is _____ 247
- d) 489 _____ 4 hundreds 8 tens and 9 units

2. Copy and complete.

a) 1 more than 365 is

b) 1 more than 479 is

c) 1 less than 354 is

d) 1 less than 494 is

e) 10 more than 278 is

f) 10 more than 589 is

g) 10 less than 253 is

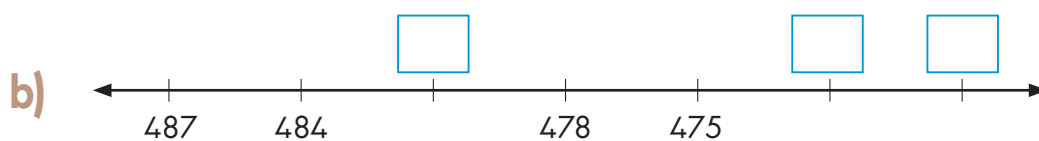
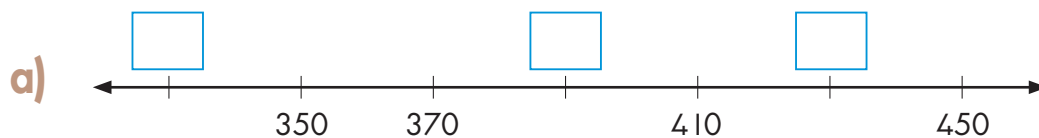
h) 10 less than 465 is

3. Write the numbers from largest to smallest.

a) 245, 254, 278, 214, 268

b) 333, 358, 341, 378, 398

4. Look at the number lines. Write the missing numbers.



5. Order the numbers from largest to smallest.

450	405	305	350
-----	-----	-----	-----

Place value

Understanding place value is important for the work that we do in Mathematics. Once you understand numbers and how they are made up, it will become easier for you to work with them when adding, subtracting, multiplying or dividing.

Example

What is the place value of each digit in the number below?



Answer

$387 = 3$ hundreds, 8 tens and 7 units.

Example

Which number is greater? Why?



Answer

$578 = 5$ hundreds, 7 tens and 8 units

$678 = 6$ hundreds, 7 tens and 8 units.

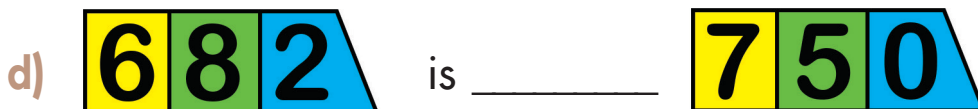
The tens and units are the same for each number, but there are more hundreds in the second number. So, 678 is greater than 578 .

Activity 5

1. What is the value of each digit?



2. Use the place value of the numbers. Write greater than, smaller than or equal to.



3. a) What is the value of each digit shown?



b) Write the number symbol.

c) Write the number name.

4. a) What is the value of each digit shown?



b) Write the number symbol.

c) Write the number name.

5. a) What is the value of each digit shown?

400

90

5

- b) Write the number symbol.
c) Write the number name.

6. Complete.

Example

458 = 4 groups of hundreds, 5 groups of tens and
8 loose ones.

458 = 400 and 50 and 8

- a) $381 = \square$ group of hundreds, \square groups of tens and
 \square loose ones.

$381 = \square$ and \square and 1

- b) $449 = \square$ groups of hundreds, \square groups of tens and
 \square loose ones.

$449 = \square$ and \square and \square

- c) $282 = \square$ groups of hundreds, \square groups of tens and
2 loose ones.

$\square = 200$ and \square and \square

Addition and subtraction

Use the different strategies that you learnt in Grades 1 and 2 to add and subtract. Study the different methods we can use to add and to subtract.

Example

Calculate $523 + 125$

Answer

Method 1

Add by breaking down one number.

Answer

$$\begin{aligned} 523 + 125 \\ &= 523 + 100 + 20 + 5 \\ &= (523 + 100) + 20 + 5 \\ &= 623 + 20 + 5 \\ &= 643 + 5 \\ &= 648 \end{aligned}$$

Method 2

Add by breaking down both numbers.

Answer

$$\begin{aligned} 523 + 125 \\ &= (500 + 20 + 3) + (100 + 20 + 5) \\ &= (500 + 100) + (20 + 20) + (3 + 5) \\ &= 600 + 40 + 8 \\ &= 648 \end{aligned}$$

Example

Calculate $789 - 227$

Answer

Method 1

Subtract by breaking down one number.

Answer

$$\begin{aligned}789 - 227 \\&= 789 - (200 + 20 + 7) \\&= (789 - 200) - (20 + 7) \\&= 589 - (20 + 7) \\&= (589 - 20) - (7) \\&= 569 - 7 \\&= 562\end{aligned}$$

Method 2

Subtract by breaking down both numbers.

Answer

$$\begin{aligned}789 - 227 \\&= 789 - (200 + 20 + 7) \\&= (700 + 80 + 9) - (200 + 20 + 7) \\&= (700 - 200) + (80 - 20) + (9 - 7) \\&= 500 + 60 + 2 \\&= 562\end{aligned}$$

Example

Calculate $345 + 346$

Answer**Method 1**

Add by identifying near doubles.

Answer

$$\begin{aligned}
 &345 + 346 \\
 &= 345 + (345 + 1) \\
 &= (345 + 345) + 1 \\
 &= (\text{double } 345) + 1 \\
 &= 690 + 1 \\
 &= 691
 \end{aligned}$$

Method 2

Add by breaking down both numbers.

Answer

$$\begin{aligned}
 &345 + 346 \\
 &= 300 + 40 + 5 + 300 + 40 + 6 \\
 &= (300 + 300) + (40 + 40) + (6 + 5) \\
 &= 600 + 80 + 11 \\
 &= 600 + (80 + 10) + 1 \\
 &= 600 + 90 + 1 \\
 &= 691
 \end{aligned}$$

Example

Calculate $523 + 125$

Answer

Method 1

Add by breaking down one number.

Answer

$$\begin{aligned}523 + 125 \\&= 523 + 100 + 20 + 5 \\&= (523 + 100) + 20 + 5 \\&= 623 + 20 + 5 \\&= 643 + 5 \\&= 648\end{aligned}$$

Method 2

Add by breaking down both numbers.

Answer

$$\begin{aligned}523 + 125 \\&= (500 + 20 + 3) + (100 + 20 + 5) \\&= (500 + 100) + (20 + 20) + (3 + 5) \\&= 600 + 40 + 8 \\&= 648\end{aligned}$$

Activity 6

- I. Add three digit numbers and two digit numbers.
- | | |
|---------------|---------------|
| a) $123 + 98$ | b) $262 + 31$ |
| c) $334 + 42$ | d) $415 + 23$ |

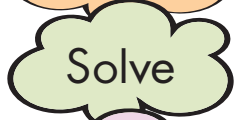
2. Add three digit numbers and three digit numbers.
- a) $148 + 252$ b) $351 + 145$
c) $541 + 149$ d) $623 + 247$
3. Add by breaking down the numbers.
- a) $424 + 136$ b) $428 + 331$
c) $528 + 432$ d) $352 + 623$
4. Subtract by breaking down the numbers.
- a) $278 - 115$ b) $385 - 254$
c) $478 - 312$ d) $679 - 347$
5. Subtract by breaking down one number only.
- a) $247 - 132$ b) $468 - 325$
c) $752 - 492$ d) $887 - 536$
6. At a concert there are 345 people at the gate waiting to get in. 259 people are already inside the stadium. How many are there altogether?
7. Half an hour before the start of the concert there were 378 fans lining up to get in.
- a) When the concert started there were 798 fans in the stadium. How many fans joined later?
- b) If half of the people were female, how many would that be?
- c) How many males are there?
- d) If 79 males entered the stadium, how many males would there be altogether?

Problem solving

Look at the strategy to solve problems in Mathematics.



What is the problem about?



What can I use to help me solve this problem?



Did I answer the question?

Use counters and your knowledge of place value to help you solve these problems.

Example

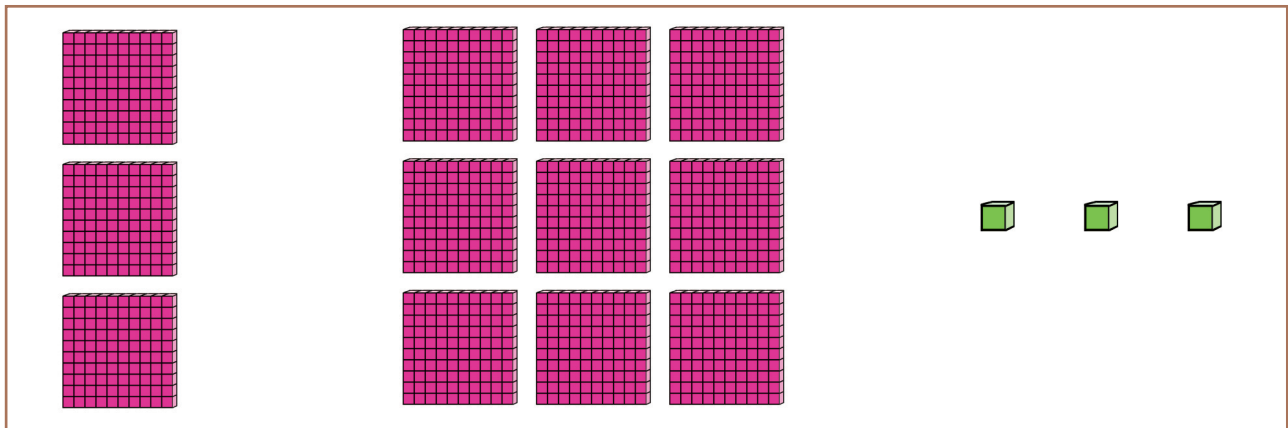
Yusuf estimates that there are 393 corn flakes in a bag of cereal.



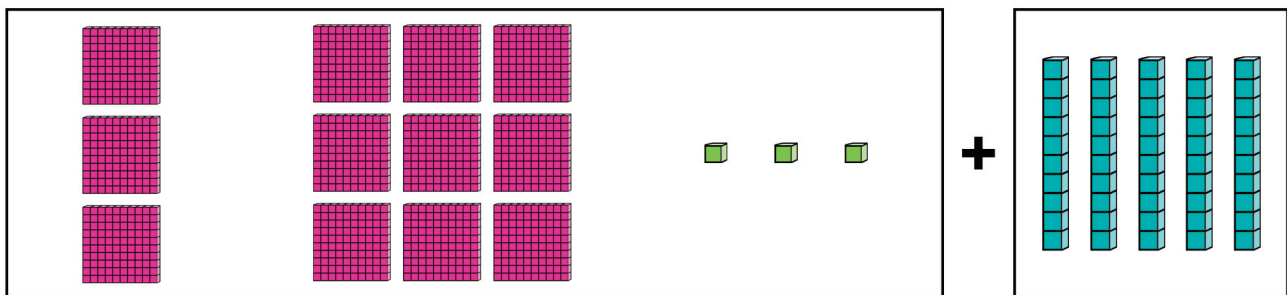
- Anari thinks that he under-estimated by at least 50. How many corn flakes does Anari think there are?
- If there are actually 438 corn flakes in a bag of cereal, how many corn flakes do two bags of cereal contain?

Answer

Yusuf's estimate



Anari's estimate



a) $393 + 50 = \square$

$$(300 + 90 + 3) + 50$$

$$300 + (90 + 50) + 3 = \square$$

$$300 + 140 + 3 = 443$$

Anari thinks there are 443 flakes

b) $438 + 438 = \square$

$$(400 + 30 + 8) + (400 + 30 + 8)$$

$$(400 + 400) + (30 + 30) + (8 + 8) = \square$$

$$800 + 60 + 16 = \square$$

$$860 + 16 = 876$$

Two bags of cereal contain 876 flakes.

Example

Tebogo is given this problem to solve:

$$175 + 123 = \square$$

Answer

This is how Tebogo solved it.

$$175 + 123 = \square$$

$$= (100 + 70 + 50) + (100 + 20 + 3)$$

$$= (100 + 100) + (70 + 20) + (5 + 3)$$

$$= 200 + 90 + 8$$

$$= 298$$

$$\text{So, } 175 + 123 = 298$$

We can solve a problem using doubling or halving.

Example

Enrico is given this problem to solve:

$$365 + 368 = \square$$

Answer

This is how he solved it.

$$\text{Double } 365 + 3$$

$$730 + 3$$

$$= 733$$

Activity 7

- l. Xander and his father are building a tree house in their backyard.
- a) If Xander has 25 pieces of wood and his father has 53 pieces of wood, how much wood do they have altogether? If they need 321 pieces of wood, how much wood do they still need?
 - b) While building the tree house, they run out of nails. There are 15 nails left. Xander's father buys four more boxes of nails. He buys two big boxes that have 75 nails in each one, and two smaller boxes that have 55 nails in each one. How many nails do they have altogether now?
 - c) To secure the tree house, Xander's father ties the corner posts to the tree. He uses 13 metres of rope for the first post, 17 metres of rope for the second post, 15 metres of rope for the third post, and 12 metres of rope for the fourth post. How much rope did he use to secure the tree house to the tree?
 - d) The tree house is almost done – they just need to paint it. Xander's father estimates that they will use 30 litres of white paint, 10 litres of red paint and 13 litres of blue paint. How many litres of paint do they need to buy in total?

Take note

You can break numbers up into smaller parts that are easier to work with, then build them up again to find the Answer.

2. Solve the following problems:

- a)** Magopo wants to buy fabric for dresses that she is making. The fabric she wants to buy costs R378 and R289. How much money does she need to buy her fabric?
- b)** If Magopo has R750 to spend, how much change will she get? Can she buy another roll of fabric that costs R256?



3. Solve the following problems:

- a)** Toshka will be 10 years old in 2 years and 2 months. She wants to calculate how many days that will be. If each year has 365 days in them and the months are 30 and 31 days long, how many days are there altogether?
- b)** A fisherman caught 328 pilchards in one day. The next day he caught 336 pilchards. How many pilchards are there altogether?

4. Solve the following problems:
- a) Allison and Cedric are travelling from Mpumalanga to Gauteng and back again by car. They drive for 187 km before resting, then travel 33 km more before stopping to get something to eat. How many kilometres have they travelled so far?
 - b) If the distance between Mpumalanga and Gauteng is 298 km, how far do they still need to drive?
5. Create three of your own word problems with an answer of 300.
- a) Write a number sentence for each problem.
 - b) Explain what technique will be the most efficient method to solve each of the problems you created.
 - c) Use the most efficient problem-solving techniques to solve two of the problems you created.

Repeated addition leading to multiplication

We use different words to describe multiplication.

double

twice

multiply

lot of

times

multiplied by

three times as much

groups of

Take note

Multiplication can be done in any order:

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

It doesn't matter in which order you multiply, your answer will always be the same.

Activity 8

1. Copy and complete the table.

	1	2	3	4	5	6	10	11	15	20
$\times 5$										
$\times 10$										

a) Describe the pattern when you multiply by 5.

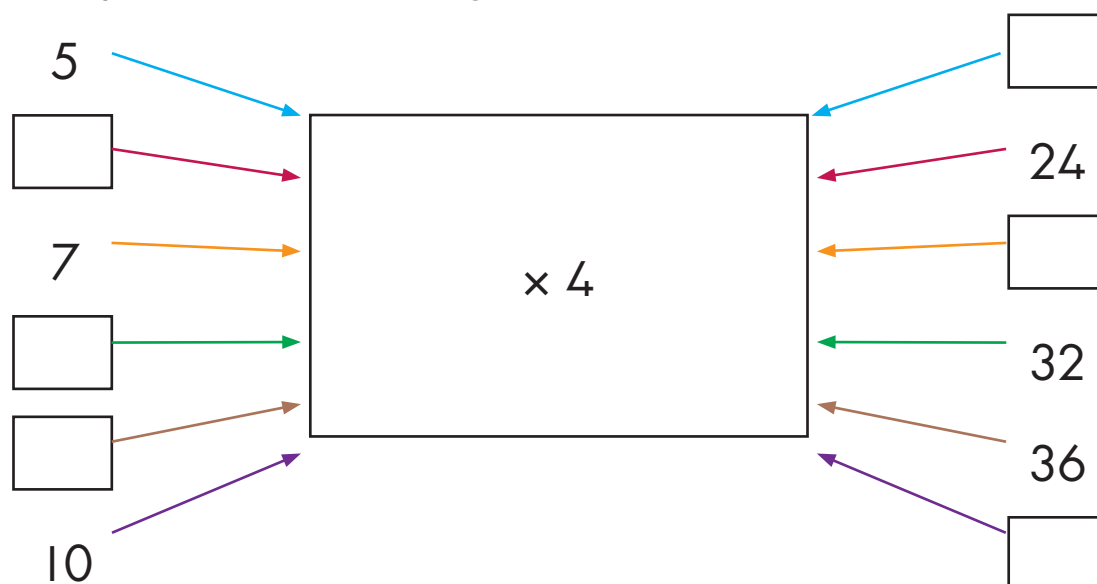
b) Describe the pattern when you multiply by 10.

2. Copy and complete the table.

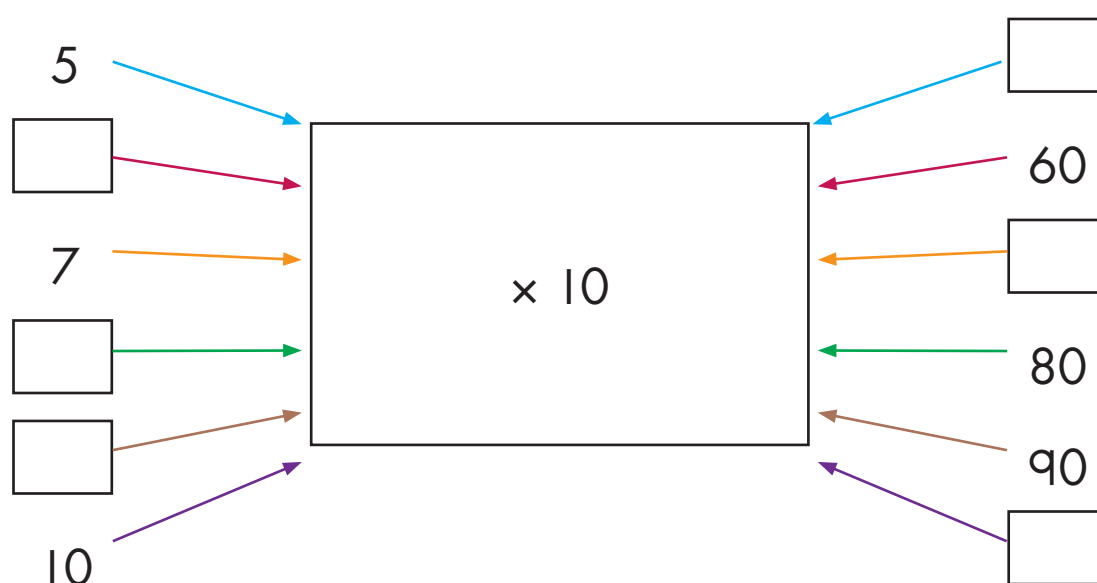
	1	2	3	4	5	6	10	11	15	20
$\times 2$										
$\times 4$										

- a) Describe the pattern when you multiply by 2.
 b) Describe the pattern when you multiply by 4.

3. Complete the flow diagram.



4. Complete the flow diagram.



5. Complete:

- a) $3 \times 5 =$
 b) $5 \times 3 =$
 c) What do you notice about 3×5 and 5×3 ?

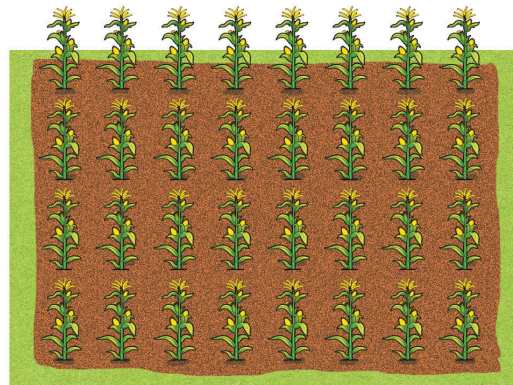
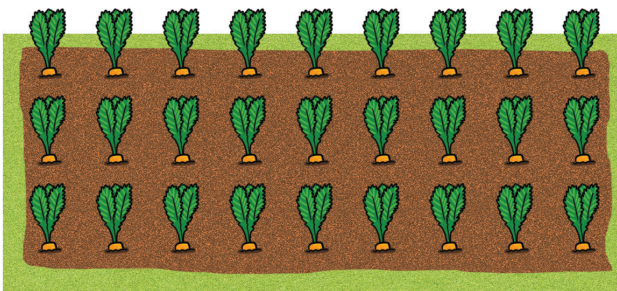
Repeated addition is the same as multiplication, for example,
 $3 + 3 + 3 + 3 = 12$ and $3 \times 4 = 12$.

Example

Mashadi plants carrots and mealies in her garden. The carrots are in 3 rows of 9 bunches. The mealies are in 4 rows of 8 plants.

Use repeated addition and multiplication to help you find the answer.

- a) How many carrot bunches are there?
- b) How many mealie plants are there?



Answer

- a) $9 + 9 + 9 = 27$ OR $9 \times 3 = 27$
- b) $8 + 8 + 8 + 8 = 32$ OR $8 \times 4 = 32$

Example

Each cake has nine candles. Solve the problem using repeated addition and multiplication.



How many candles are there altogether?

Answer




Repeated addition	$9 + 9 = 18$
Multiplication	$9 \times 2 = 18$

Solve the following problems using repeated addition.

6. a) $10 + 10 + 10 + 10 + 10$ is the same as \times
- b) $9 + 9 + 9 + 9 + 9 + 9 + 9$ is the same as \times
- c) $12 + 12 + 12$ is the same as \times
- d) $7 + 7 + 7 + 7 + 7$ is the same as \times

7. How many trees?

Use repeated addition to calculate the answer.

- a) 
- b) 
- c) 

d)



8. At aftercare, teacher Florence makes lunch for all the Grade 3 learners.
- a) Each learner gets 3 baby potatoes.
There are 15 learners.
How many baby potatoes has teacher Florence used?
 - b) Each learner gets 2 slices of bread.
There are 15 learners.
How many slices of bread are there altogether?
 - c) Teacher Florence makes tea.
She packs the tea cups in 4 rows of 5 each.
How many cups of tea did she make?

Grouping and sharing

Problems that involve sharing are about: sharing equally; and how much each one gets.

Example

Share 18 lollipops equally amongst 4 friends.

- a) How many lollipops would each learner get?
- b) How many lollipops will remain?

Answer

- a) Each friend would get 4 lollipops.
- b) There will be 2 remaining

Problems that involve grouping are often about how many groups can be made.

Example

Kimmy invited her friends to her birthday party.
They are going to the movies to watch her favourite movie.
There are 23 of them altogether.
Each car can take 4 children.
How many cars would they need for all of them?

Answer

There are 23 people altogether.
If each car can fit only 4 people, they need 6 cars altogether.

Solve these problems.

Activity 9

1. 75 learners and 4 teachers visit the zoo.
 - a) If each minibus taxi takes 12 people, how many minibuses would they need?
 - b) If 1 teacher and 3 learners are absent, would they still need the same number of minibuses?
 - c) Explain why.
2. Estimate first.
 - a) 65 learners want to play hockey. There are 11 players per team. How many teams will there be?
 - b) Is your estimate more than 5 or less than 5?
 - c) Calculate the correct number. Are there any learners left over?
 - d) If there are learners left over, they can become substitutes. Each team has to have 5 substitutes. Are there enough learners left over for substitutes?
3. Share 60 toffee apples amongst 12 children.
 - a) How many will each child get?
 - b) Are there any left over?

Division is what we do when we work with sharing and grouping. We split a number of objects into groups of equal sizes, sometimes with a remainder and sometimes without.

Example

Ashley has 33 bananas. He divides them equally into 4 packets to sell.

- a) How many bananas are there in each packet?
- b) How many are left over?

Answer

- a) 33 shared amongst 4 packets equals 8 remainder 1.
 $33 \div 4 = 8$ remainder 1
- b) There is 1 banana left over.

Use division to help you solve these problems.

- 4. Share 150 sweets amongst 20 friends so that they all get the same number of sweets.
- 5. There are 54 girls and 66 boys.
 - a) How many children altogether?
 - b) Break the girls up into 9 groups. How many groups are there?
 - c) Break the boys up into 11 groups. How many groups are there?

Fractions

Read this poem and then answer the questions.

Fractions, fractions
All around me
As I climb
A fraction tree...



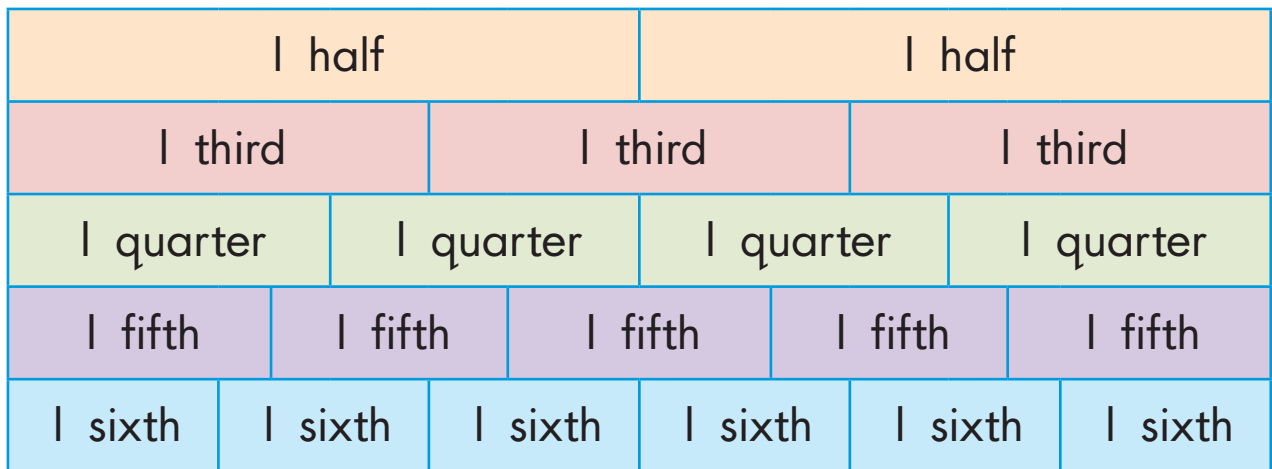
First a quarter
Then a third
Then a half
I see a bird...



Then, three quarters
Near the top!
At one whole,
I have to stop...

6. Why does the boy reach a quarter before he reaches one third?

Look at the fraction wall below to help you find an answer.



7. Look at the fraction wall:

- How many quarters make a half?
- How many sixths make a third?
- Is 1 half bigger or smaller than 2 thirds?
- Is 2 fifths bigger or smaller than 2 sixths?

8. Find the fraction:

- Find 2 thirds of 15 sweets.
- Find 3 fifths of 35 marbles.
- If Tania was given 6 sweets out of 48, what fraction of sweets was she given?

Working with money

These are the coins we use in South Africa:



These are the bank notes we use in South Africa:



Example

You pay R2,50 for a sticker. How much will you pay for four stickers?

Answer

$$R2,50 + R2,50 + R2,50 + R2,50 = R10,00$$

Activity 10

1. Write in rands and cents.

a) 457c

b) 890c

c) 459c

d) 950c

e) 623c

f) 789c

2. Write in cents.

a) R8,90

b) R15,70

c) R23,50

d) R132,99

e) R79,99

f) R112,50

Group discussion. Work with a friend.

3. In how many ways can you make up R500 by using only notes? How do you know when you have all the answers?

4. Mapule and her two partners receive a bonus of R800 for a project they completed. Each one needs to get an equal share of the bonus. How much will each one get?

5. Vikesh teaches music lessons.

a) For each hour he gets paid R150.

If he works for 4 hours, how much will he earn?

b) If he works for 3 hours on 5 days per week, how much will he earn?

6. A chocolate costs R6,50.

a) How much will two chocolates cost?

b) You pay with a R20 note. How much change will you get?

7. Mrs Rapule wants to buy a watch that costs R150.

a) Which notes can you use to make up R150? Find two ways.

b) If Mrs Rapule decides to buy the same watch for herself and her daughter, how much would she need to pay?

c) Mrs Rapule decides that she wants a different watch. The cost of the watch is three times as much as the first one she saw. How much does the watch cost?

d) If Mrs Rapule has R700 to spend, will she be able to buy a watch for her and one for her daughter?

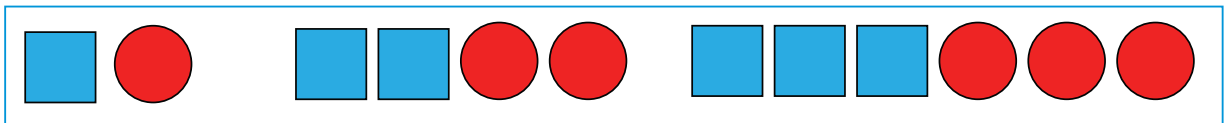
Learn about patterns

Geometric patterns

Activity II

We can use objects and shapes to make patterns.

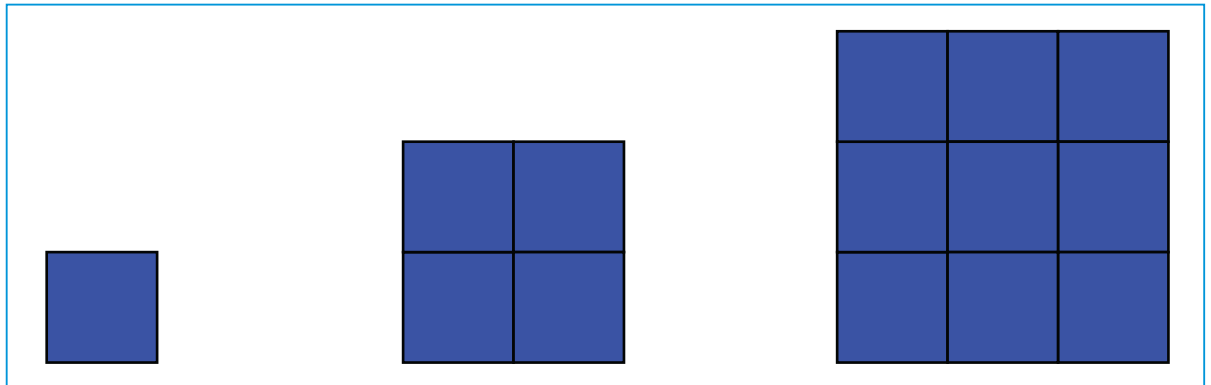
1. a) Copy and extend the pattern with two more groups.



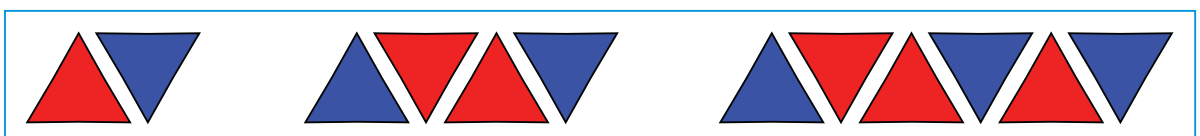
- b) Describe the pattern.

2. a) Copy and extend the pattern with two more groups.
(You may also use shapes to make this pattern).

- b) Describe the pattern.



3. a) Copy the pattern.

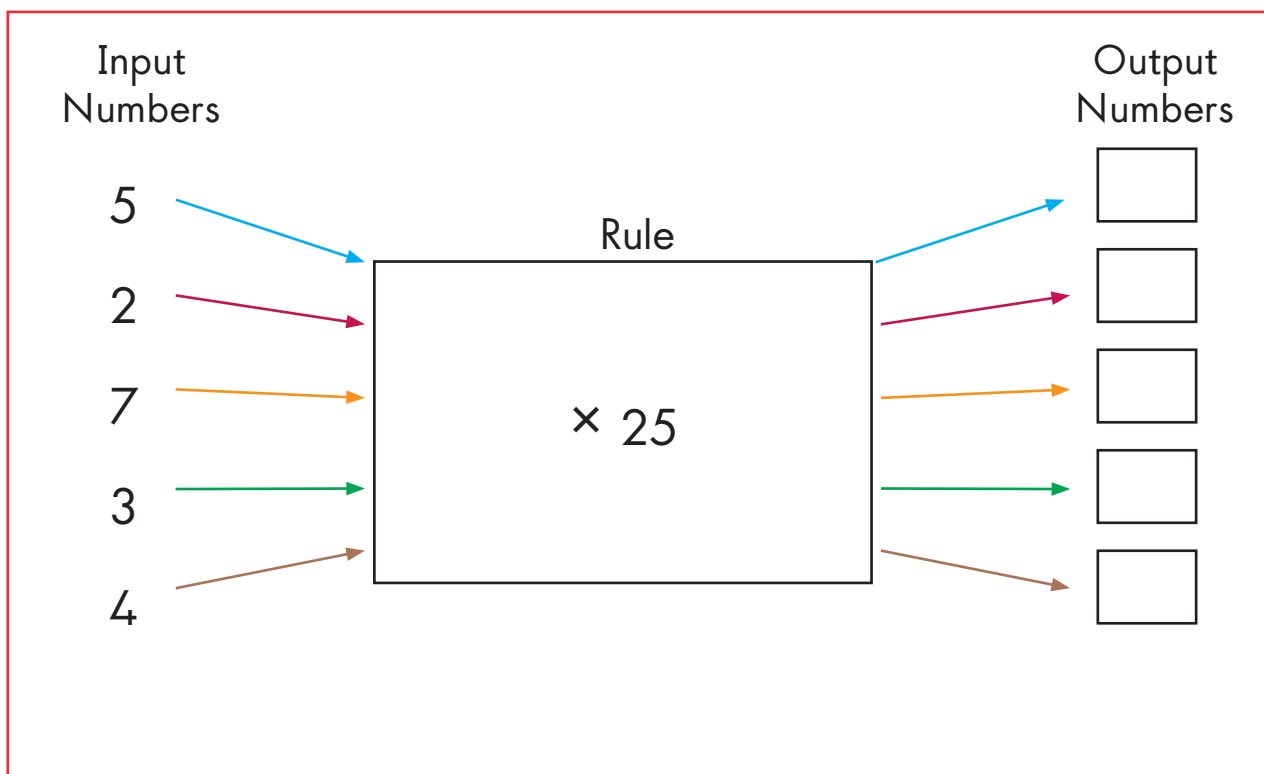


- b) Describe the pattern that you notice.

Number patterns

Activity 12

1. a) Copy and fill the missing numbers



TERM 3

- b) Draw a flow diagram for the following sequence.
450; 500; 650; 700; 750

2. Copy and complete the following patterns.

a) 392; 394; 396; ; ; ;

b) 455; 460; 465; ; ;

c) ; 320; 315; 310; ; ;

d) ; ; 490; 470; ;

e) 185; 180; ; 170; ; 160; ;

3. Copy and complete

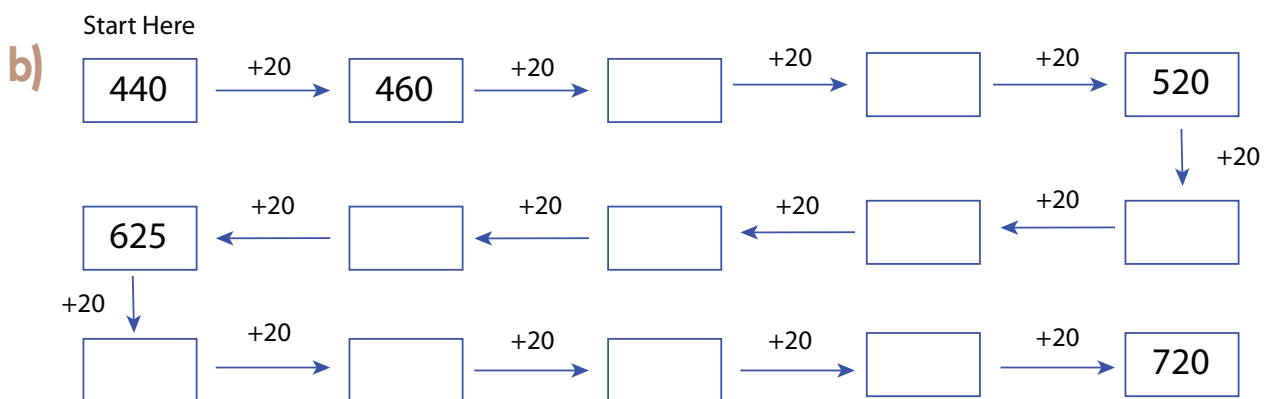
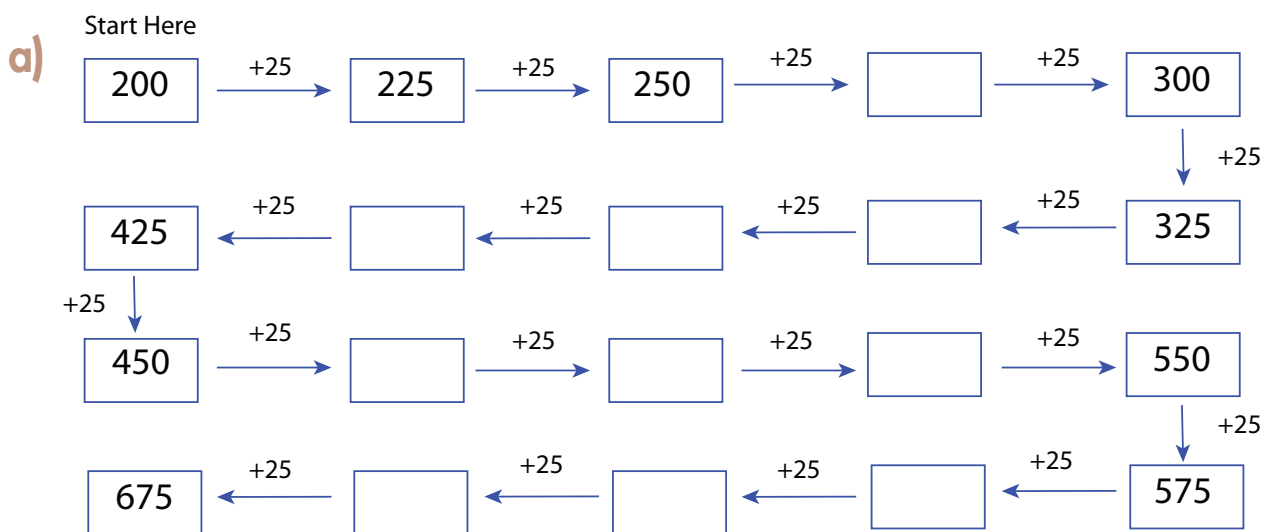
a) 50; 100; 150; ; ; ; ;

b) 5; 10; 15; ; ; ; ;

c) ; 4; 6; 8; ; ; ;

d) ; ; ; 80; 100; 120; ;

4. Copy and fill in the missing parts.



5. a) Count forwards in 25s from 600 to 750.

b) Count backwards in 25s from 600 to 100.

c) Count backwards in 20s from 500 to 100.

6. a) Start Here

$$\boxed{698} \xrightarrow{+2} \boxed{} \xrightarrow{+2} \boxed{}$$

$$\boxed{698} \xrightarrow{+4} \boxed{}$$

b) Start Here

$$\boxed{464} \xrightarrow{+2} \boxed{} \xrightarrow{+2} \boxed{}$$

$$\boxed{464} \xrightarrow{+4} \boxed{}$$

c) Start Here

$$\boxed{720} \xrightarrow{+2} \boxed{} \xrightarrow{+2} \boxed{} \xrightarrow{+2} \boxed{} \xrightarrow{+2} \boxed{}$$

$$\boxed{720} \xrightarrow{+4} \boxed{} \xrightarrow{+4} \boxed{}$$

- d) What do you notice about the number that you started with in each pair?
- e) What do you notice about the answers of each pair of calculation?

7. a) Copy and complete the table

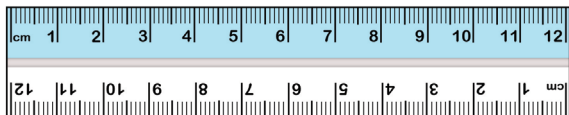
Number of cattle	50	51	52	53	100	200
Number of legs	200					

- b) Make a flow diagram to represent the table above.

Measuring length in centimetres

Measuring with a ruler

We can measure length using another measure called the centimetre. We write **cm** for centimetre.



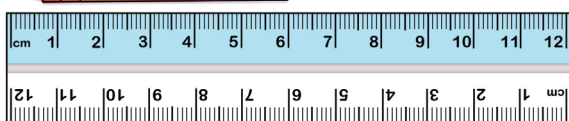
Your ruler is marked in centimetres.

We can use the ruler to measure the length of objects.

Example

When measuring with a ruler we line up the object being measured with the zero on the ruler.

How long is the crayon?



Answer

The crayon is 6 cm long.

Group activity. Work with a friend

A cm is about the width of your thumb.

Use your thumb to measure the length of the bar below.






This bar is about _____ thumbs long.






Now use a ruler to measure the length of the bar.

This bar is _____ cm long.







Activity 13

1. Without using a ruler estimate how long each of these lines are in centimetres.
 - a) 
 - b) 
 - c) 
2. Now use a ruler to measure the lengths.
3. First estimate then use your ruler to measure the lengths of the bars below. Copy and complete the table in your classwork book.

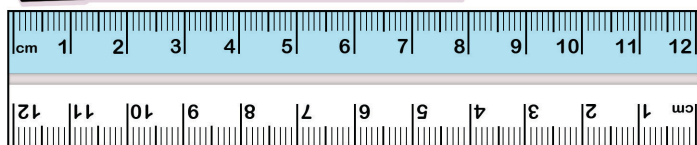
	Bars	Estimate	Measure
a)			
b)			
c)			
d)			
e)			

4. First estimate then measure the length of these lines.
Copy and complete this table in your exercise book.

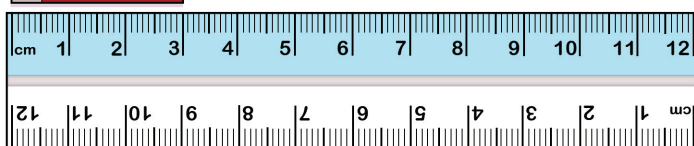
- a) 
- b) 
- c) 
- d) 

	Estimate	Measure	Difference
a)			
b)			
c)			
d)			

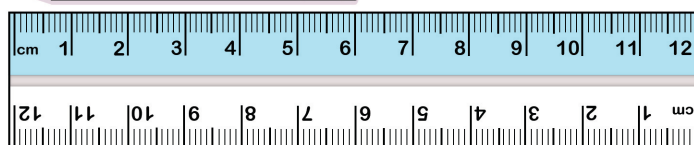
5. What is the length?



a) The glue stick is _____ cm long.



b) The eraser is _____ cm long.



c) The pencil is _____ cm long.



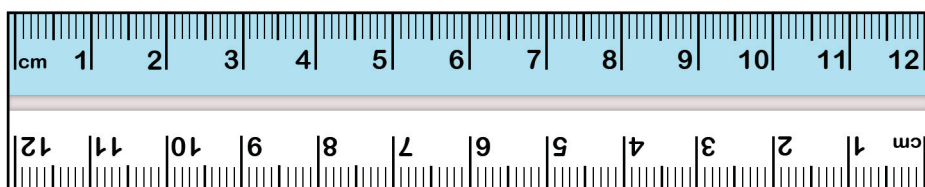
d) The pen is _____ cm long.



e) The piece of chalk is _____ cm long.

Comparing lengths

Example



The blue bar is 3 cm long.

The red bar is 7 cm long.

The yellow bar is 10 cm long.

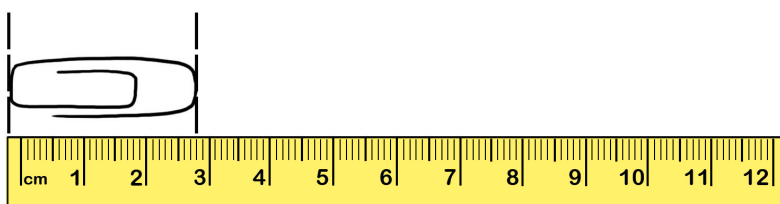
The yellow bar is the longest. It is 3 cm longer than the red bar and 7 cm longer than the blue bar.

The shortest bar is the blue bar. It is 4 cm shorter than the red bar and 7 cm shorter than the yellow bar.

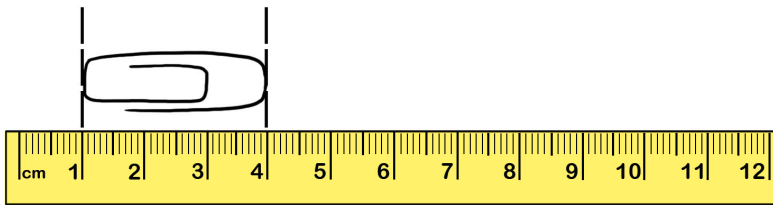
Activity 14

1. Which is the correct way of measuring?

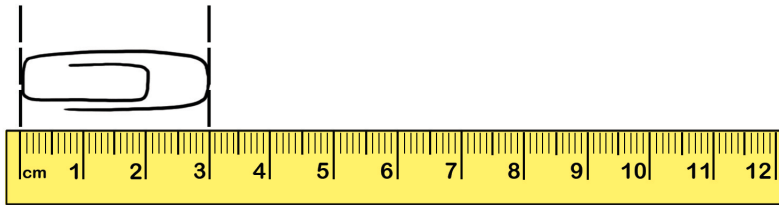
a)



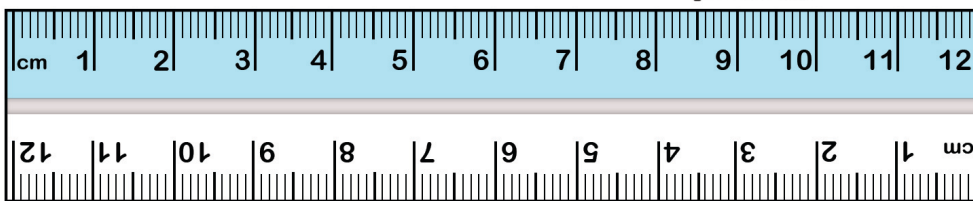
b)



c)



2. What are the lengths?



- a) What is the length of the pen?
- b) What is the length of the glue stick?
- c) What is the length of the eraser?
- d) What is the shortest length?
- e) What is the longest length?
- f) The eraser is _____ cm shorter than the glue stick.
- g) The pen is _____ cm longer than the glue stick.
- h) The pen is _____ cm longer than the eraser.

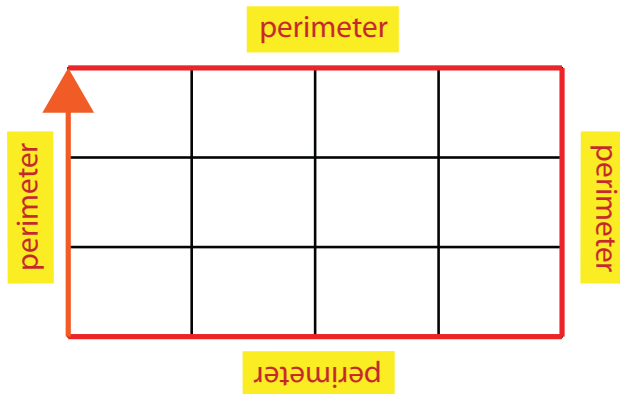
3. The widths of curtains are given. The lengths of the curtains are the same.

Curtain A	Curtain B	Curtain C
120 cm	60 cm	90 cm

- a) By how much is curtain A wider than curtain B?
- b) By how much is curtain C wider than curtain B?
- c) By how much is curtain A wider than curtain C?
- d) Order the curtains according to the widths, from the smallest to the largest.

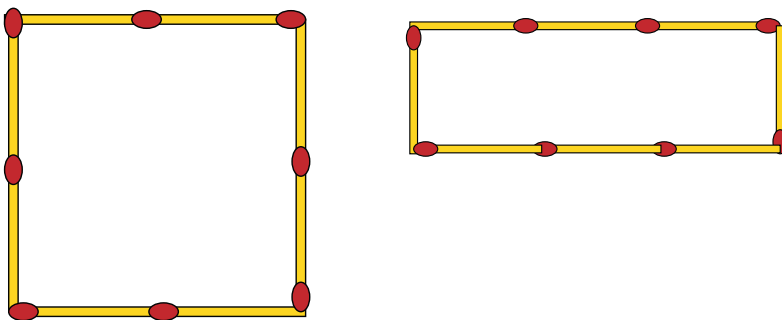
Perimeter

The distance around a figure is called its **perimeter**.



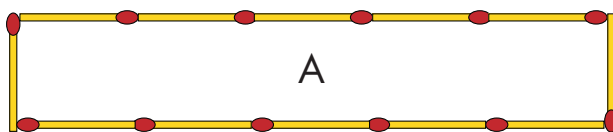
Example

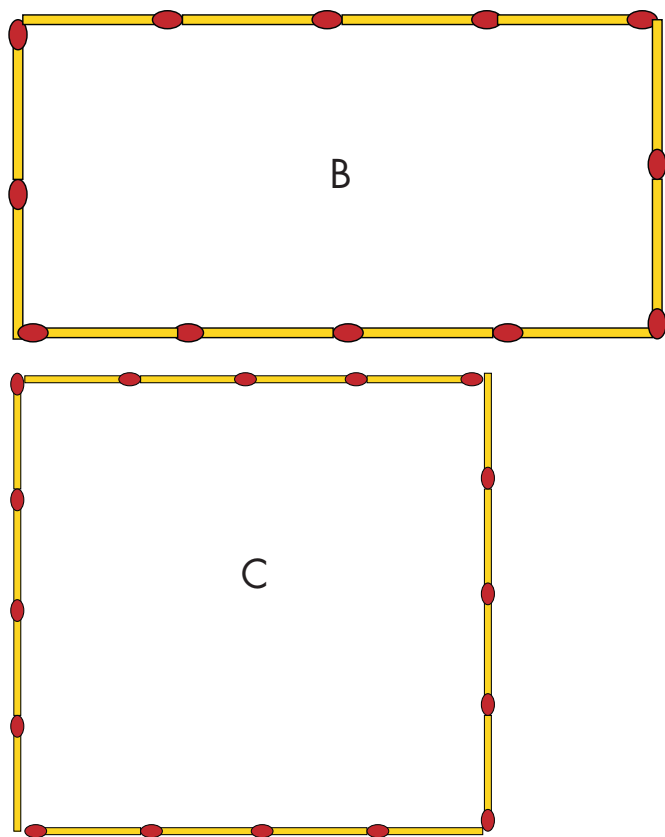
The distance around each shape below is 8 match stick units. We can also say the perimeter around each shape is 8 matchstick units.



Activity 15

- Without counting the number of matchsticks, say which of the figures below has the longest perimeter. Explain your answer.





2. Count the number of matchsticks for each figure, then copy and complete the table below.

Shape	Perimeter
A	_____ matchstick units
B	_____ matchstick units
C	_____ matchstick units

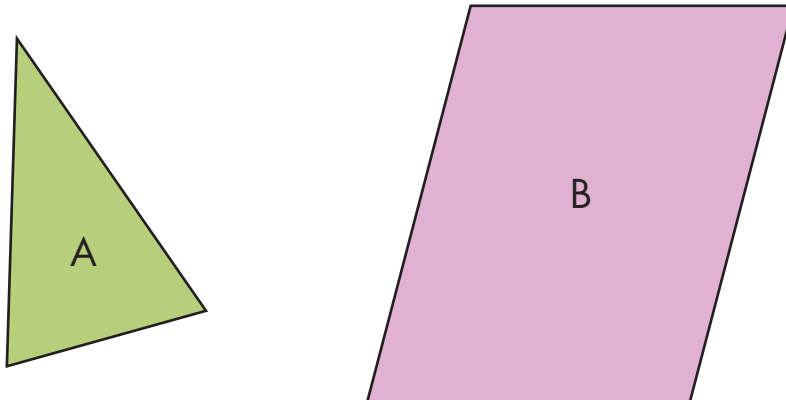
3. What can you say about the perimeters of the three shapes?

We can also use a piece of string to measure the distance around a shape or figure.



Activity 16

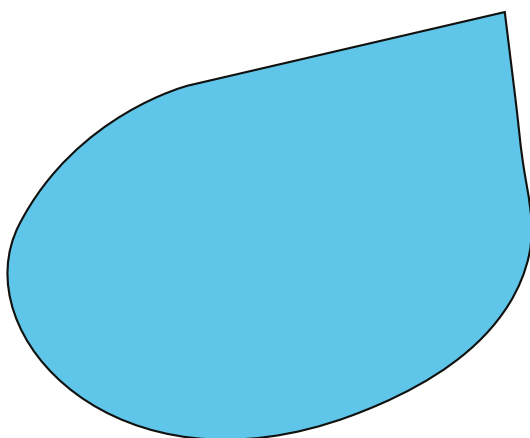
1. a) Estimate the perimeters of the shapes below. Give your answers in centimetres.



- b) Use a piece of string to measure the perimeter of the two shapes, copy and complete the table below.

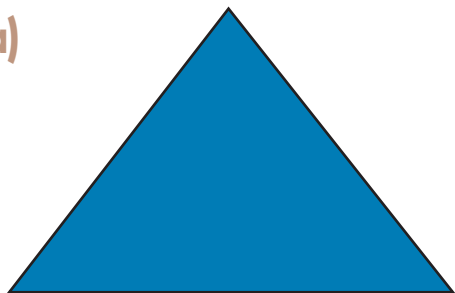
Shape	Estimated perimeter in centimetres	Measured perimeter in centimetre
A		
B		

2. Use a piece of string to measure the perimeter of the shape below. Give your answer in centimetres.

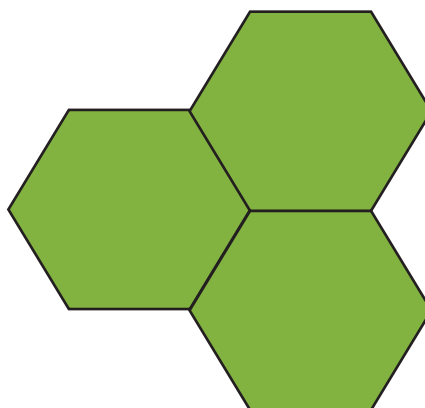


3. Use a piece of string to measure the distance around each shape below:

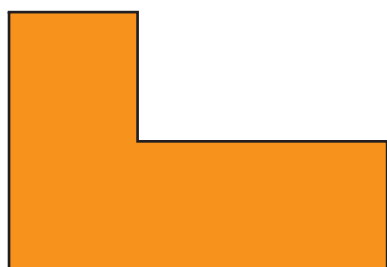
a)



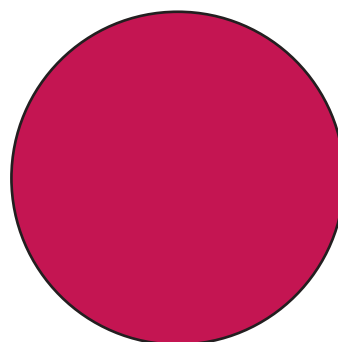
b)



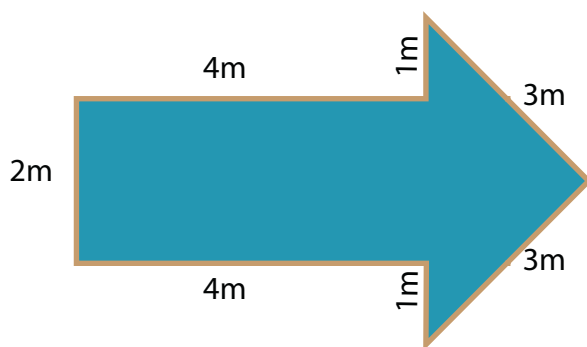
c)



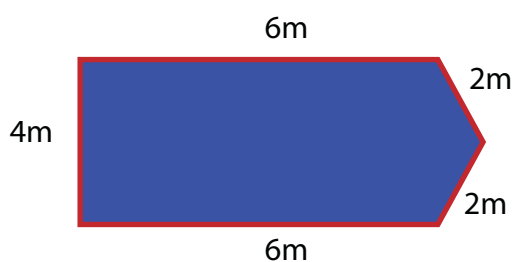
d)



4. What should the length of a piece of string that can measure the distance around this shape be?



5. What should the length of a piece of string that can measure the distance around this shape be?



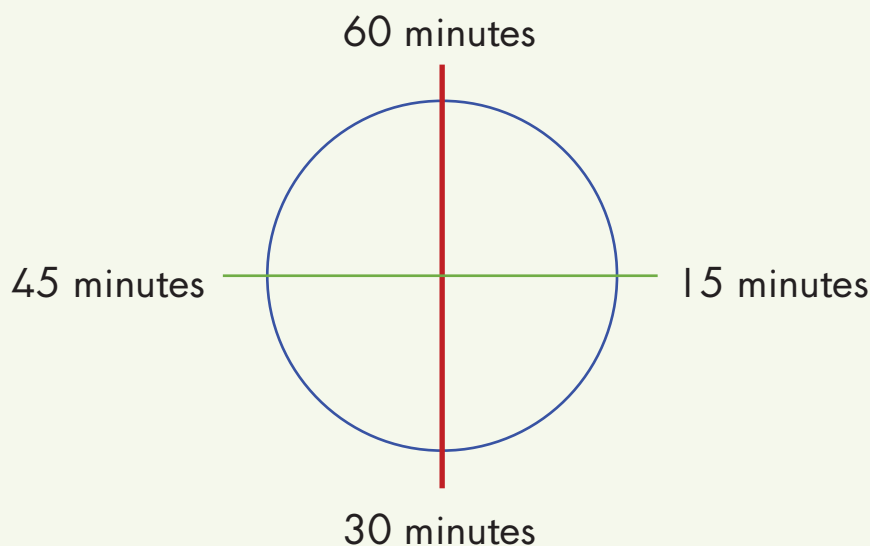
Telling time

Use analogue clocks to tell time

We can divide the face of the clock into four parts. We call each of the four parts a quarter.

Dividing the face of the clock into parts is the same as dividing an hour into four parts or quarters.

An hour is 60 minutes long. If we divide 60 minutes into four parts, each part is 15 minutes long, or we say it is a quarter of an hour long.



To tell time we must be able to answer the following questions:

- Where does the hour hand point to?
- Where does the minute hand point to?
- How do we read this time?
- How is this time written in words?

Example



The short hand is the hour hand. It points to 9.

The long hand is the minute hand. It is at 12.

The time shown on the clock is 9 o'clock.

Activity 17

I. What is the time? Write the time in words.

a)		b)		c)	
d)		e)		f)	

Example



Where does the hour hand point to?

Where does the minute hand point to?

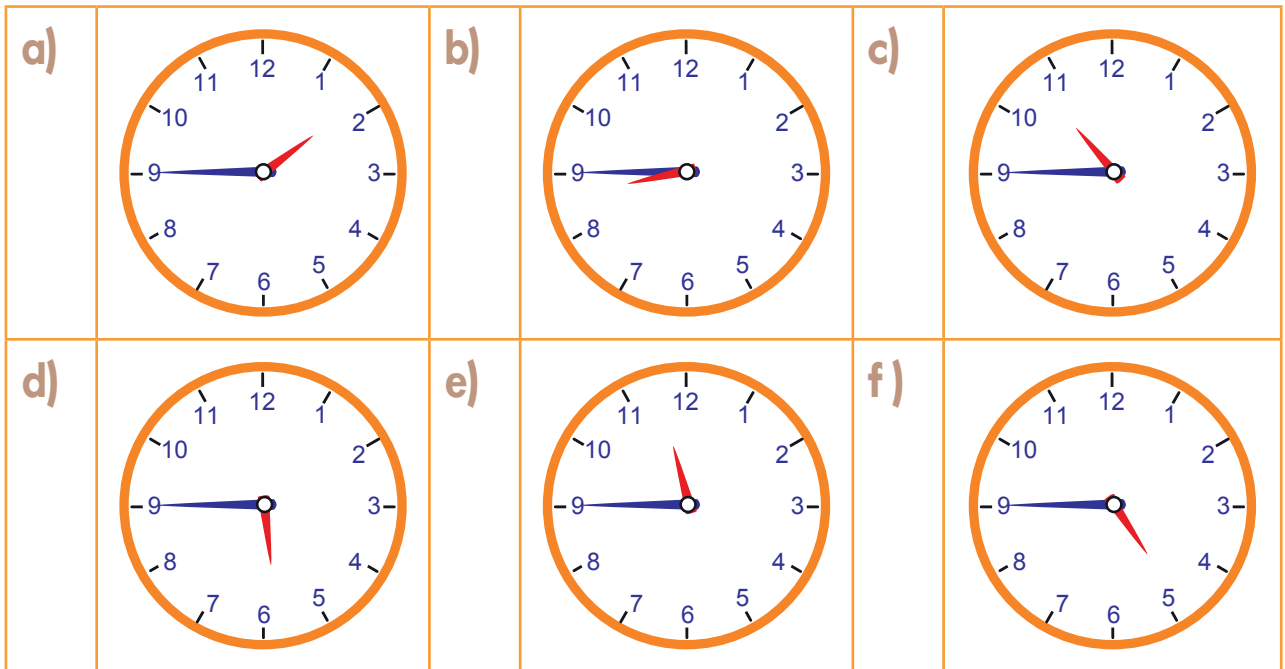
How do we read this time?

How is this time written?

Answer

This time is quarter to seven. For times that are a quarter to the hour, the minute hand always points to 9.

2. What is the time? Write the time in words.

**Example**

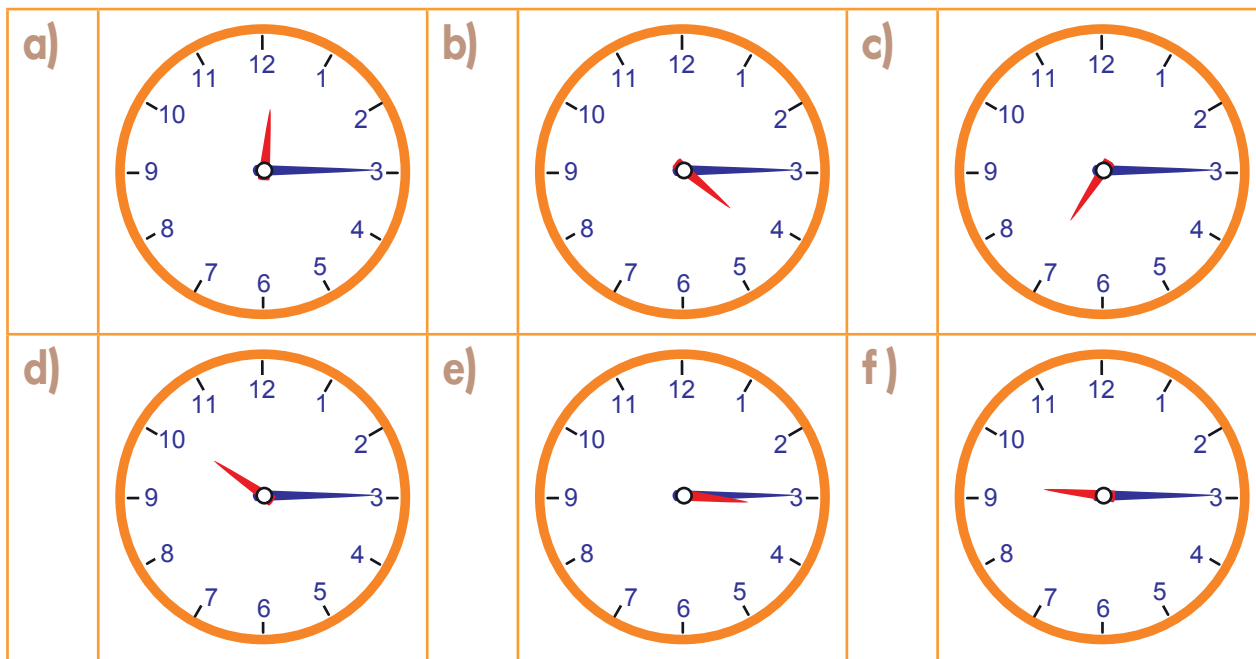
Where does the hour hand point to?
 Where does the minute hand point to?
 How do we say this time?
 How do we write this time?

Answer

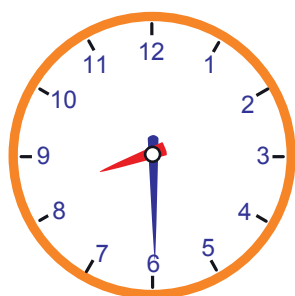
This time is quarter past 6.

For times that are quarter past the hour, the minute hand always points to 3.

3. What is the time? Write the time in words



Example

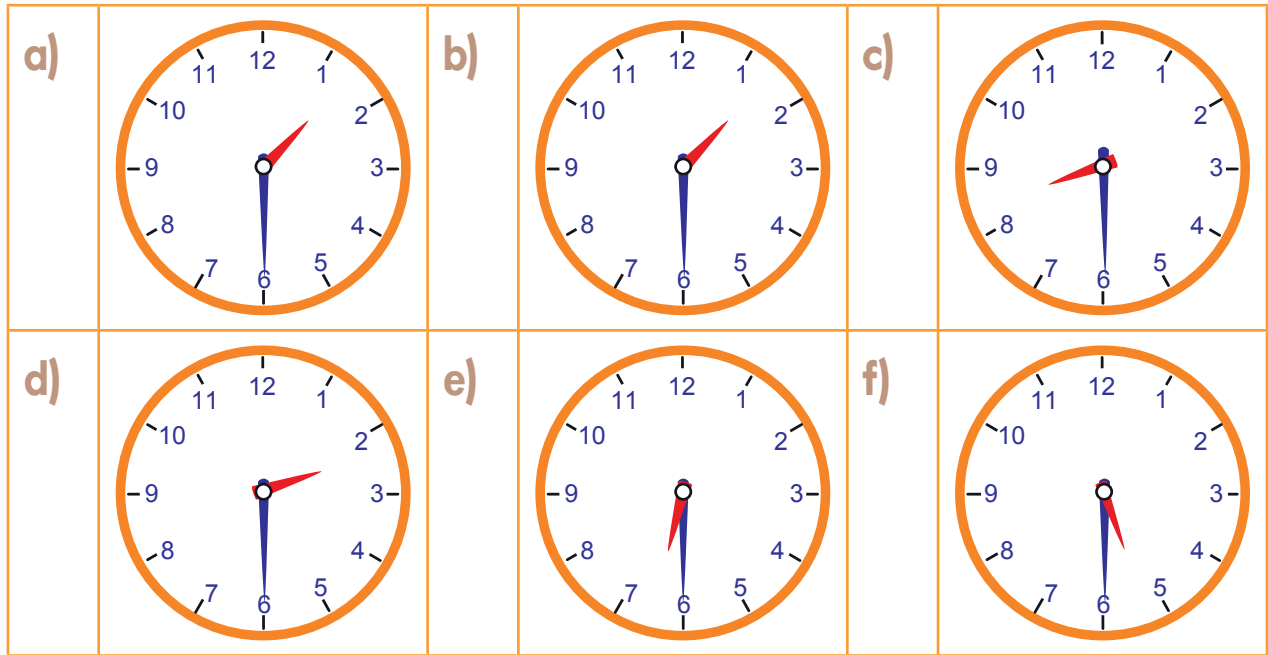


Where does the hour hand point to?
Where does the minute hand point to?
How do we read this time?
How do we write this time in words?

Answer

This time is half past 8. For times that are half past the hour, the minute hand always points to 6.

4. What is the time? Write the time in words.



5. Draw clock faces to show the time.

- a) Ten o'clock
- b) Quarter to 11
- c) Half past 6
- d) Quarter past 2

Use digital clocks to tell time

In digital time:

- : 15 indicates quarter past the hour
- : 30 indicates half past the hour
- : 45 indicates quarter to the hour

The time shown on the clock below is one minute past twelve.

12:01

Take note

On a digital clock the hours are separated from the minutes by a colon (:).

Example






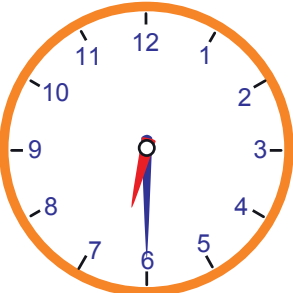


- a) What is the number to the left of the colon?
- b) Where does the minute hand point to?
- c) What is the time shown on this clock?




Answer




- a) Hours
- b) Minutes
- c) The time is 6 o'clock.

The clocks show different times on digital and analogue clocks.







Quarter to six	Six o'clock	Quarter past 6	Half past 6
			
			

6. What is the time? Write it in words.






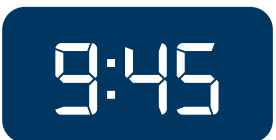
a)		b)		c)	

d)		e)		f)	
----	-----------------------------------------------------------------------------------	----	------------------------------------------------------------------------------------	----	-------------------------------------------------------------------------------------







7. What is the time? Write it in words

a)		b)		c)	
d)		e)		f)	

8. Draw analogue clocks showing these times.

a)		b)		c)	
d)		e)		f)	

9. What is the time? Write it in words.

a) 	b) 	c) 
d) 	e) 	f) 

10. Draw these times on a digital and analogue clock.

- a) twelve minutes to seven.
- b) seven minutes past twelve.
- c) forty-five minutes past eight.
- d) one minute to eleven.

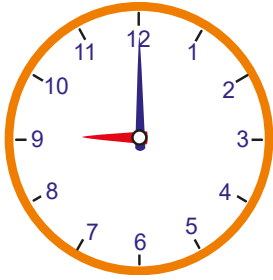
Using the clock

Example

Mother starts with the washing at nine o'clock in the morning. She finishes with the washing and ironing at half past eleven in the morning. How long does it take her to do the washing and ironing?

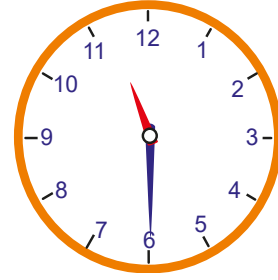
Answer

Starting time



How long?

Finishing time



From 9 o'clock to 11 o'clock is 2 hours. From 11 o'clock to half past 11 is another 30 minutes.
It takes her two and a half hours.

Activity 18

1. I wake up at six o'clock in the morning. I leave for school at quarter to seven. How long does it take me to get ready for school in the morning?
2. We had a picnic on Saturday from 9 o'clock in the morning to half past 4 in the afternoon. How long was the picnic?
3. I leave home for school at quarter to seven in the morning. I arrive back home from school at quarter to three in the afternoon. For how many hours am I away from home?
4. How long is the school break, if it starts and ends at given times?

Start:	10 o'clock	Quarter to 11	Half past 11	Quarter past 10
End:	Half past 10	Quarter to 12	12 o'clock	Half past 10
How long?				

The calendar

A calendar shows the days, weeks and months of a particular year. It helps us to organise days for social, religious and other purposes.

These are all the months of the year.

January	February	March	April	May	June
July	August	September	October	November	December

Activity 19

1. Copy and complete the table below.

Names of the months that have 30 days	Names of the months that have 31 days

2. Which month does not belong to either of the two groups in question 1?

3. This is the calendar for the year 2015.



- a) Use the calendar for May 2015 to answer the following questions:
- (i) How many days are there from the 10th to 19th?
 - (ii) How many weeks are there from the 1st to the 8th?
 - (iii) Today is 22 May. My brother's birthday was 10 days ago. It was on _____?
 - (iv) Today is 22 May. What date was it exactly three weeks ago?

- b) Copy the table into your classwork book. Fill in the missing dates in the table. Use the calendar to help.

Date 1 week ago	Date today	Date 1 week later
	27 January	
	21 July	
	9 December	

- c) Women's Day is on 9 August.
- (i) Khwezi ordered flowers for her mother 5 days before Women's Day. When did she place the order?
 - (ii) Her brother organised a party for her 3 days before Women's Day. On what date was the party held?

4. Let's say it is 25 September 2015 now.

Your classmates are talking about their birthdays.

- a) Jenny says her birthday was in March.
How many months ago was Jenny's birthday?



- b) Johanna says her birthday is in two months' time.
In which month was Johanna born?

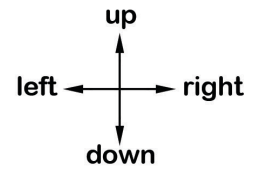


- c) Keketso says it is only 90 days to her birthday.
When is Keketso's birthday?



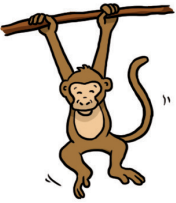

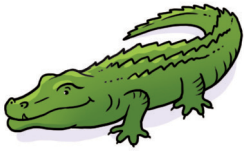

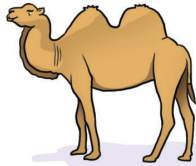
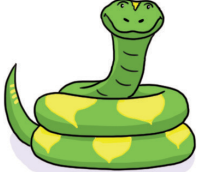










Position and direction

You need to understand directions, or you will get lost. You also need to be able to give clear directions to other people. We usually first give the left and right directions and then the up and down directions when working with blocks.



Your class is visiting the zoo. Look at the map of the zoo.

Key								
	Entrance to the zoo	Ice-cream stand	Snake pit	Tiger cage	Lion cage	Camel garden	Crocodile den	Monkey playground

Example

Give the directions from the entrance of the zoo to the ice-cream stand.

Answer

2 blocks to the right and 1 block down.

Example

Give the directions from the crocodile den to the ice-cream stand.

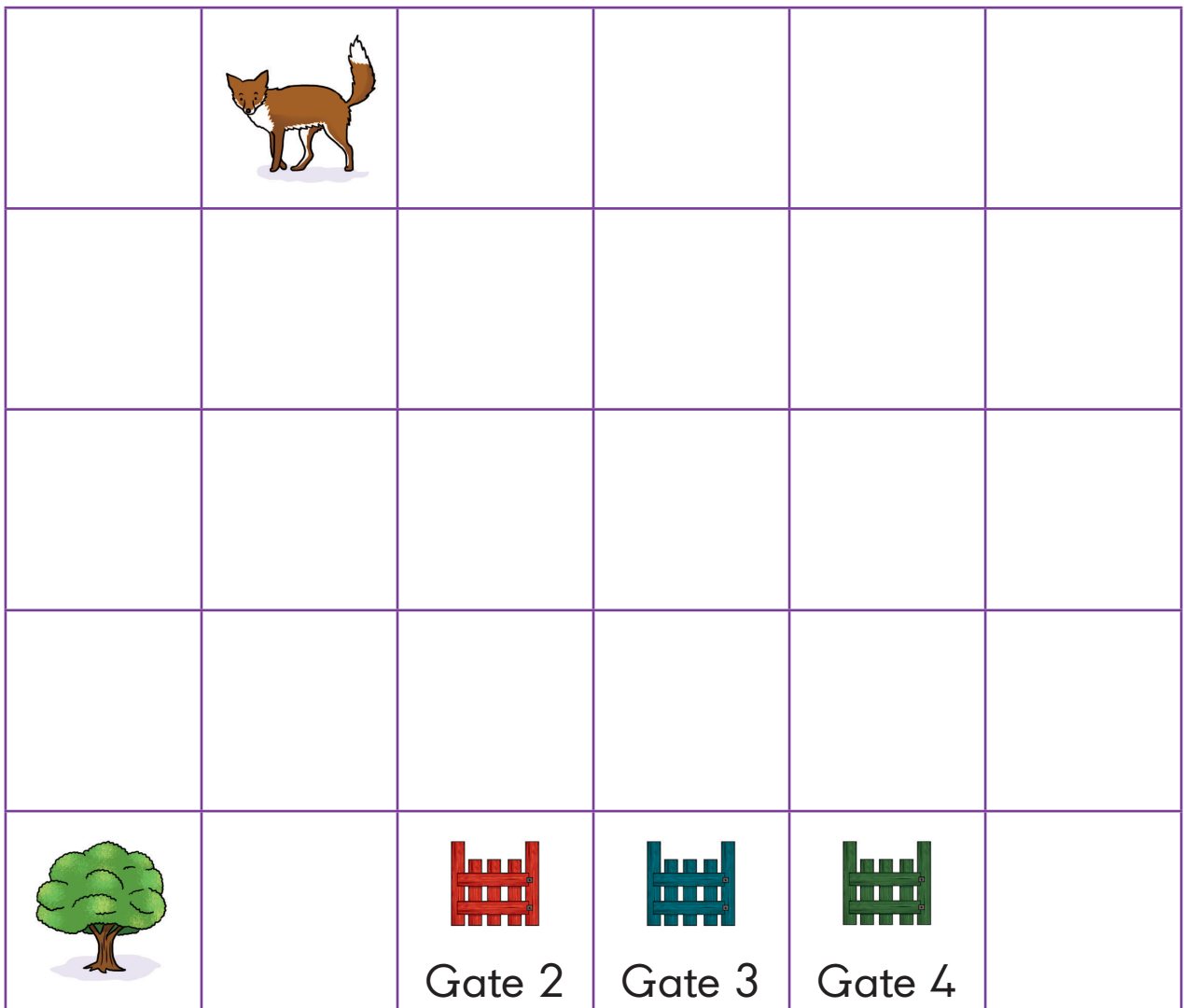
Answer

2 blocks to the left.

Activity 20

- I. Look at the map of the zoo on the previous page.
 - a) Give the directions from the tiger cage to the monkey playground.
 - b) Give the directions from the ice-cream stand to the camel garden.
 - c) Give the directions from the tiger cage to the lion cage.
 - d) Give the directions from the camel garden to the snake pit.
 - e) Give the directions from the ice-cream stand to the snake pit.
 - f) Find the lion. What animal is one block above the lion?
 - g) Make up two questions of your own and give the answer.

2. The fox runs three blocks to the right and then four blocks down.

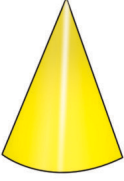
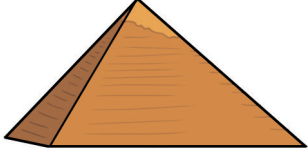

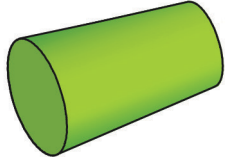


- a) To which gate did the fox run?
- b) Over how many blocks did the fox run?

Three-dimensional objects

Three-dimensional objects take up space and they have three dimensions: length, width and height. A **face** is a flat surface on a three-dimensional object.

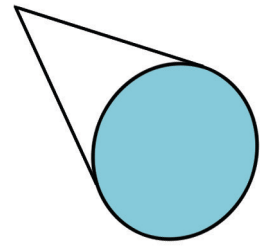
Discuss the three-dimensional objects.

Cone	Pyramid	Sphere	Cylinder
			
<ul style="list-style-type: none">• Has a circular base and comes up to a point.• Has a circular flat surface.• Has a curved surface.• Can roll and slide it.• Cannot stack it.	<ul style="list-style-type: none">• Has a square base and comes up to a point.• Triangular flat faces.• Base usually a square.• Straight sides.• Can slide.• Cannot stack it.	<ul style="list-style-type: none">• Curved surface.• No straight sides.• Can roll it.• Cannot stack it.	<ul style="list-style-type: none">• The ends have flat circular surfaces.• A curved surface.• Can be stacked.• Can roll and slide it.

Example

Look at the cone.

- a) What shape is the shaded face?
- b) Will a cone slide or roll?

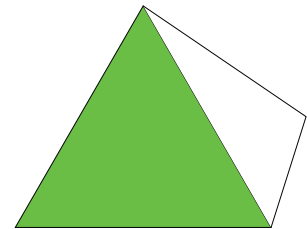
**Answer**

- a) A circle
- b) It can slide and roll.

Example

Look at the pyramid.

- a) What shape is the shaded face?
- b) Can it slide or roll?

**Answer**

- a) A triangle
- b) It can slide.

Example

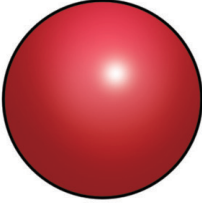
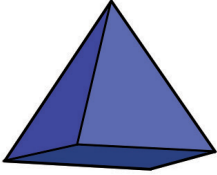

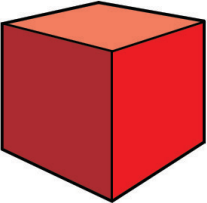
Explain why you cannot stack the soccer balls.

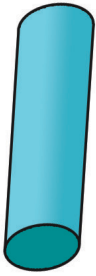
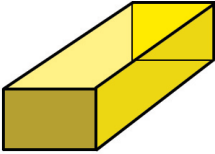
**Answer**

We cannot stack balls because they have no straight sides.

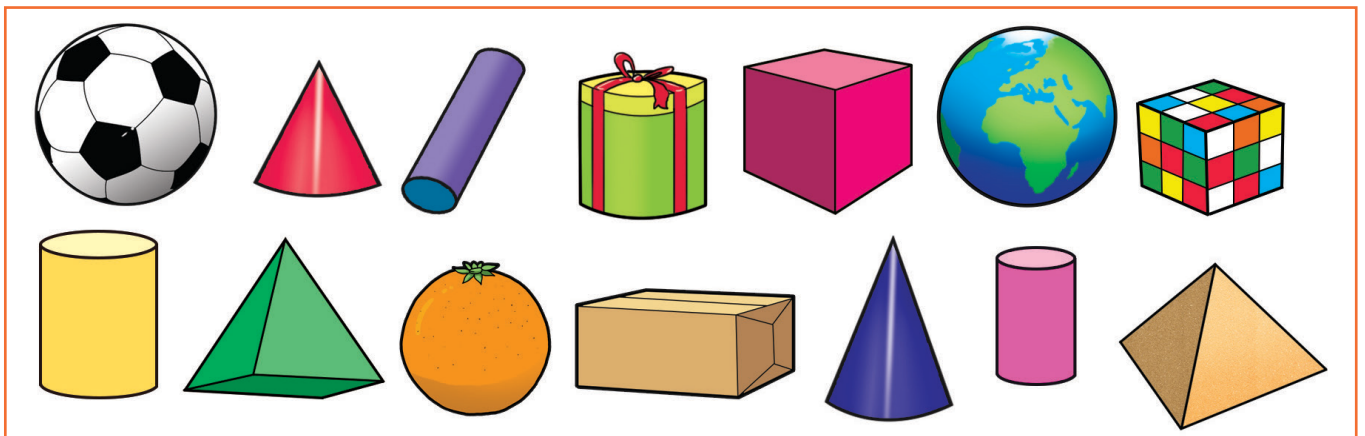
Activity 21

I. Copy and complete the table. Do not draw the object.

		Name the object	What does it look like? Describe it	What faces can you see of each object?	Can you slide it or roll it?
E.g.		Sphere	<ul style="list-style-type: none"> • Curved surface. • No straight sides. • Round 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • You can roll it.
a)			<ul style="list-style-type: none"> • Triangular flat faces. • Base usually a square. 		
b)			<ul style="list-style-type: none"> • A flat surface. • A curved surface. 		
c)			<ul style="list-style-type: none"> • Square faces. • Flat surfaces. 		

d)		<ul style="list-style-type: none"> • A curved surface. • Circular flat faces. 		
e)		<ul style="list-style-type: none"> • Flat surfaces. • Rectangular faces. 		

2. Look at the objects in the frame and answer the questions that follow.



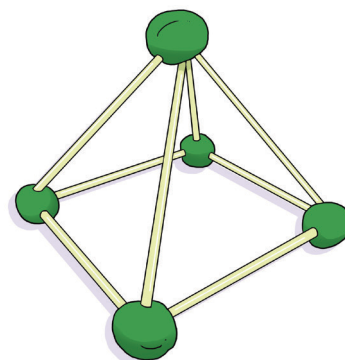
- How many cones in the frame?
- How many spheres in the frame?
- How many pyramids in the frame?
- How many of the objects in the frame have only flat surfaces?
- How many of the objects in the frame have only curved surfaces?

3. Copy and complete the table. Tick ✓ if true and cross ✗ if not.

Do not draw the object.

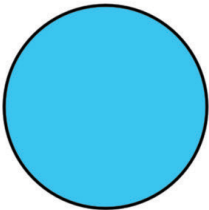
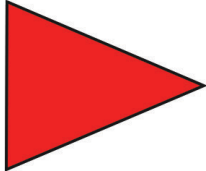




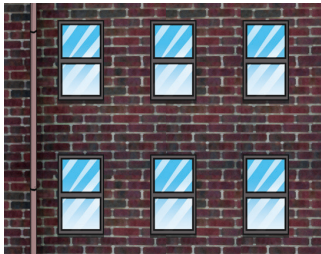
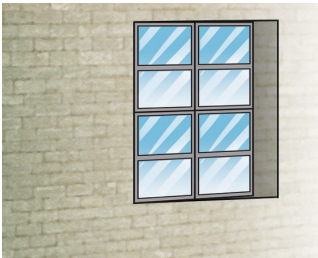
Three-dimensional object		Flat surface	Curved surface
E.g.	Cylinder	✓	✓
a)	Sphere		
b)	Cone		
c)	Prism		
d)	Pyramid		
e)	Prism		

4. Use straws, toothpicks, rolled paper, clay, marshmallows, or any suitable recycled material and build a skeleton of a pyramid. Look at the example.



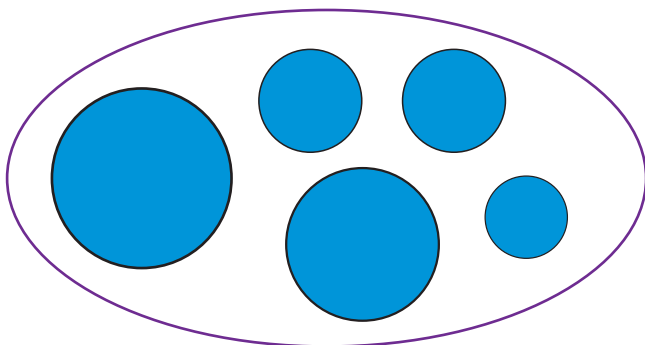
Two-dimensional shapes

A two-dimensional shape has height and width only.

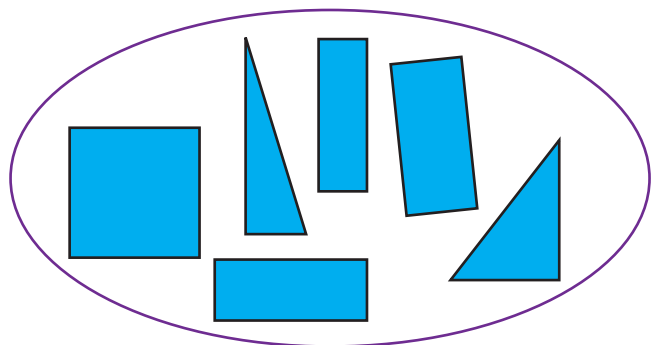
Circle	Triangle	Square	Rectangle
			
			
A circle is round.	A triangle has three straight sides.	A square has four straight sides of the same length.	A rectangle has four straight sides. The opposite sides are equal in length.

Example

Look at the two groups. How were they sorted?



Group A



Group B

Answer

The shapes in Group A are all:

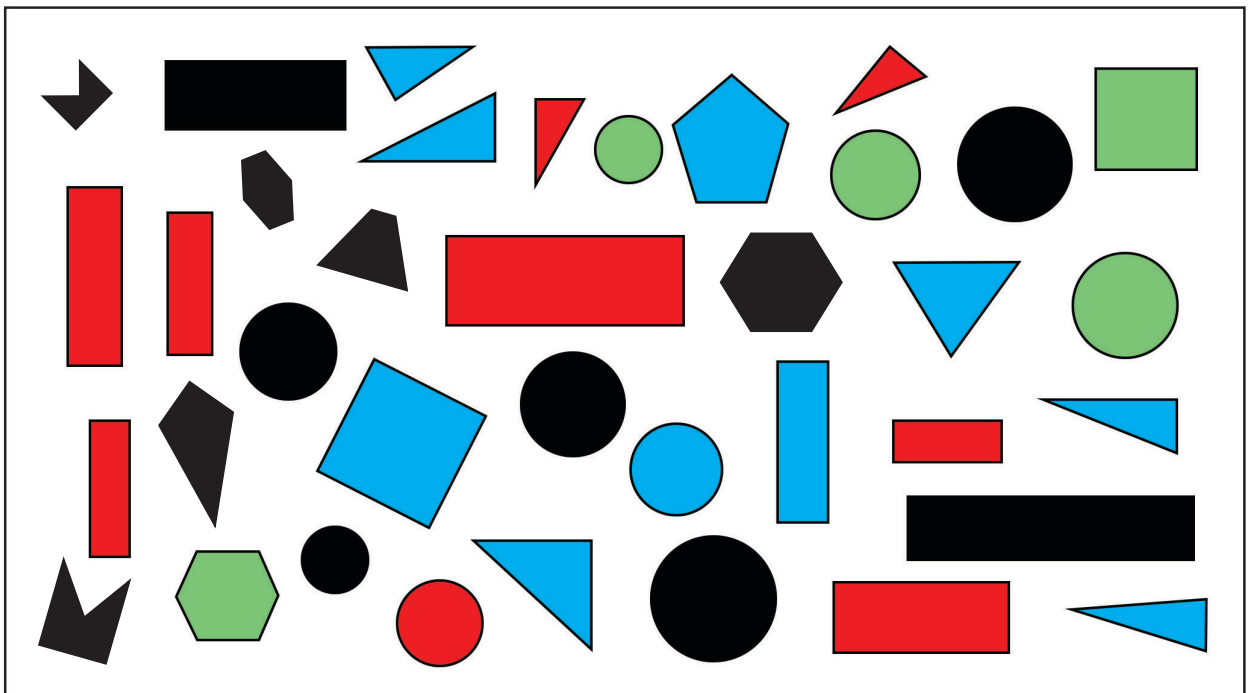
- blue,
- circles,
- round.

The shapes in Group B are all:

- blue,
- triangles, squares or rectangles,
- with straight sides.

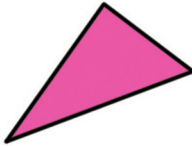



Activity 22

1. Look at the shapes in the frame and answer the questions.






- How many black circles in the frame?
- How many blue triangles in the frame?
- How many red rectangles in the frame?
- How many shapes with only straight sides in the frame?
- How many shapes with only round sides in the frame?

2. Copy and complete the table. Tick ✓ if the sides are straight and cross ✗ if not straight. Do not draw the shapes.

	Name of shape	Shape	Straight sides
E.g.	Triangle		✓
a)	Circle		
c)	Rectangle		
d)	Square		

3. Complete the table. Do not draw the picture.

		Name the two-dimensional shape	Straight sides or round sides
E.g.		Circle	Round
a)			
b)			

c)



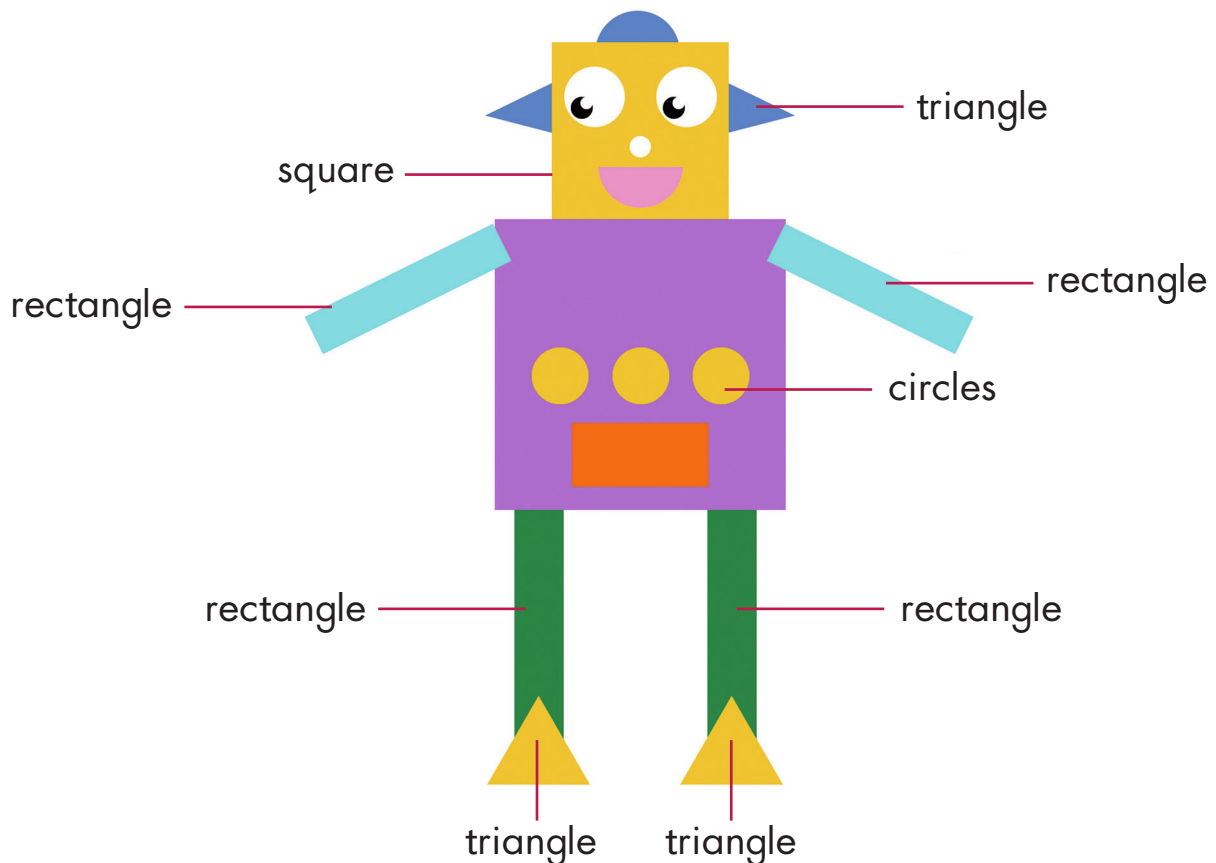
d)



e)



4. a) Draw a robot using triangles, squares, rectangles, and circles.
- b) Label the shapes. Look at the example for ideas.



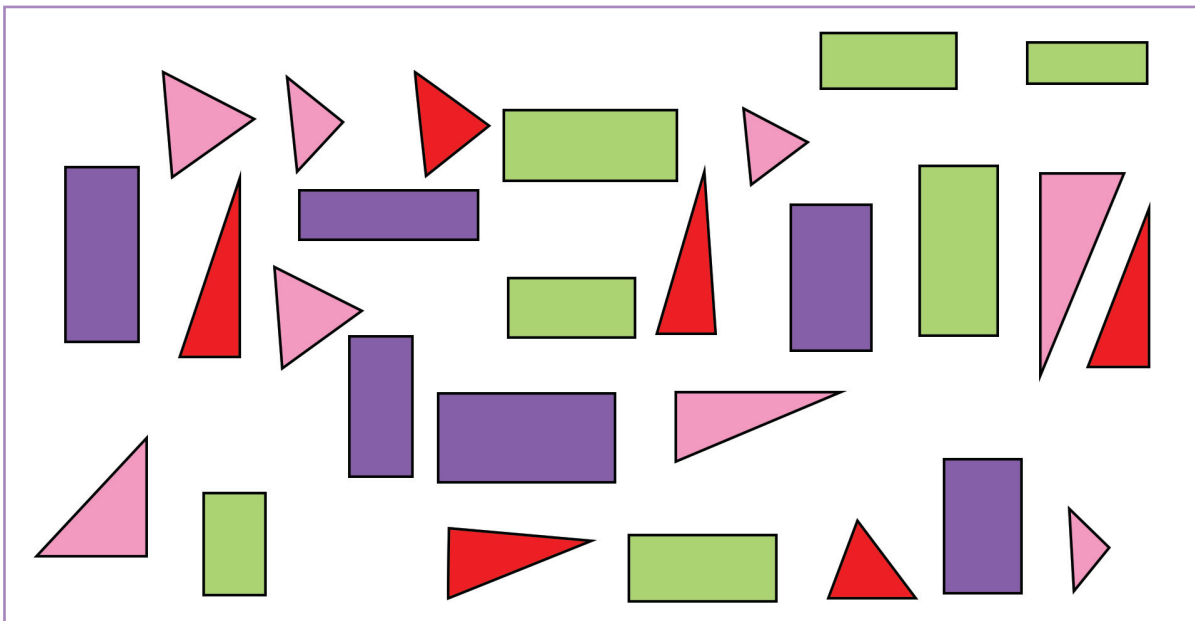
Analysing data

We can visually display the data we collected in a pictograph.

We use bar graphs, pictographs and tally tables to analyse data.

Example

Look at the shapes.



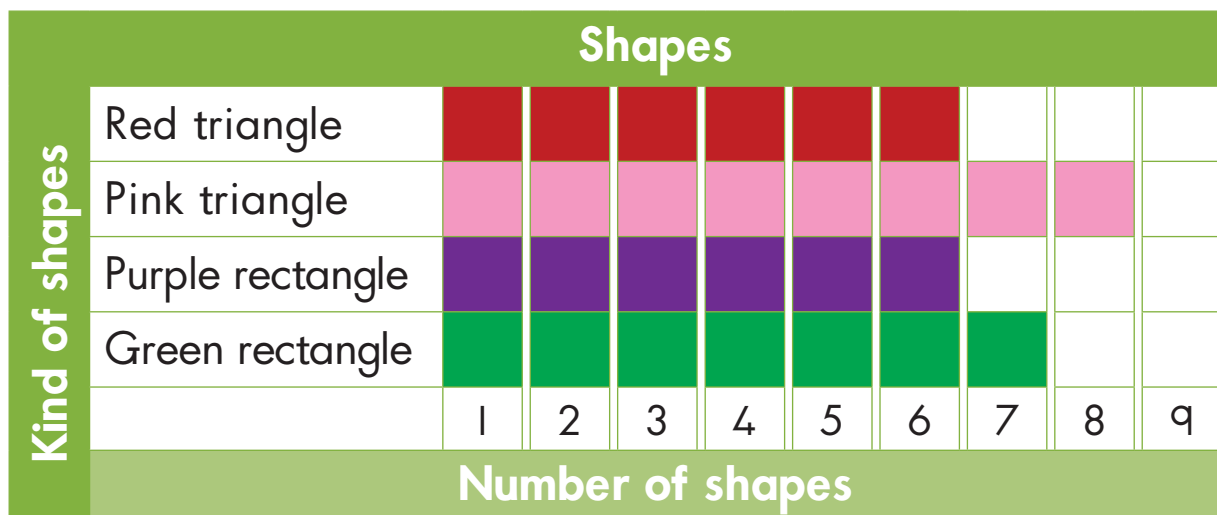
- Create a tally table to sort the number of shapes according to colour.
- Represent the number of shapes according to colour on a bar graph.

Answer

a) **Tally table: Number of shapes according to colour**

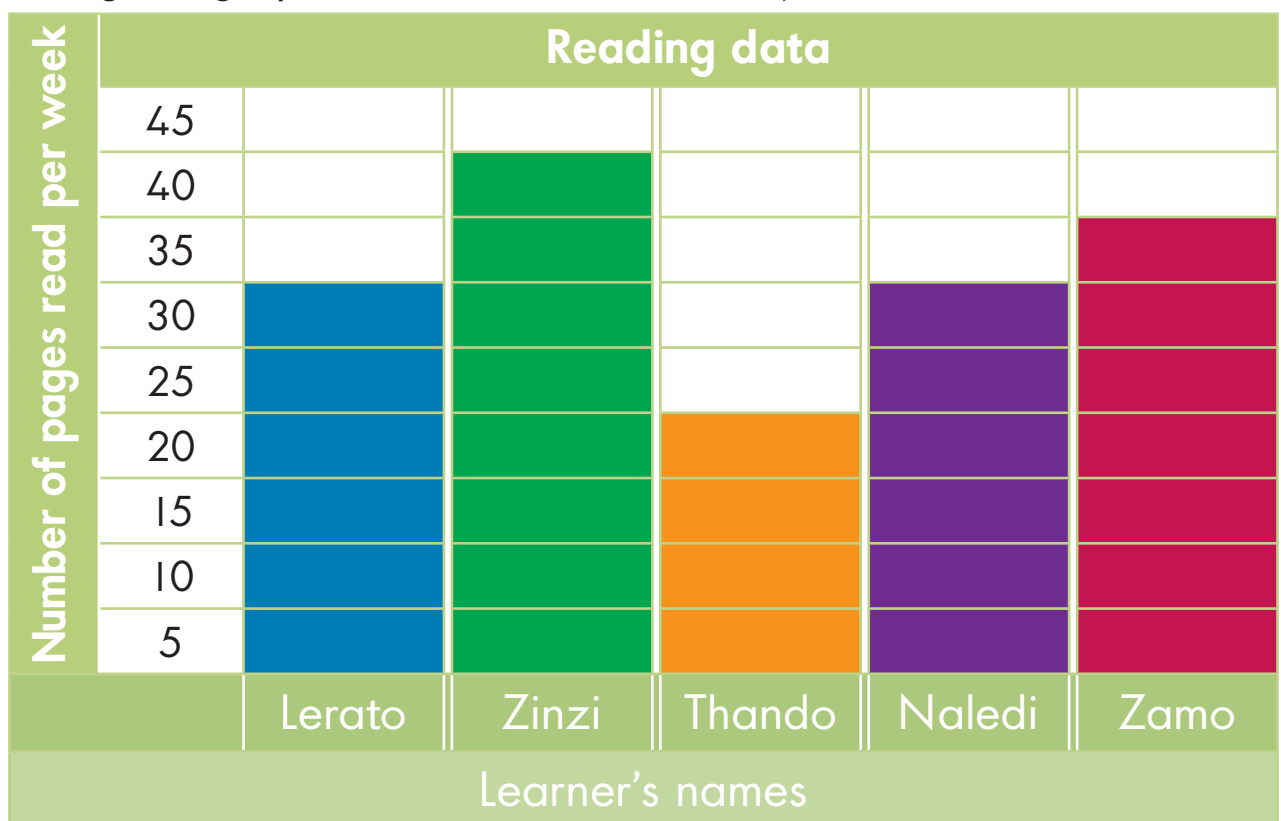
Kinds of shapes	Tally	Frequency
Red triangles	//// /	6
Pink triangles	//// ///	8
Purple rectangle	//// /	6
Green rectangle	//// //	7

b)



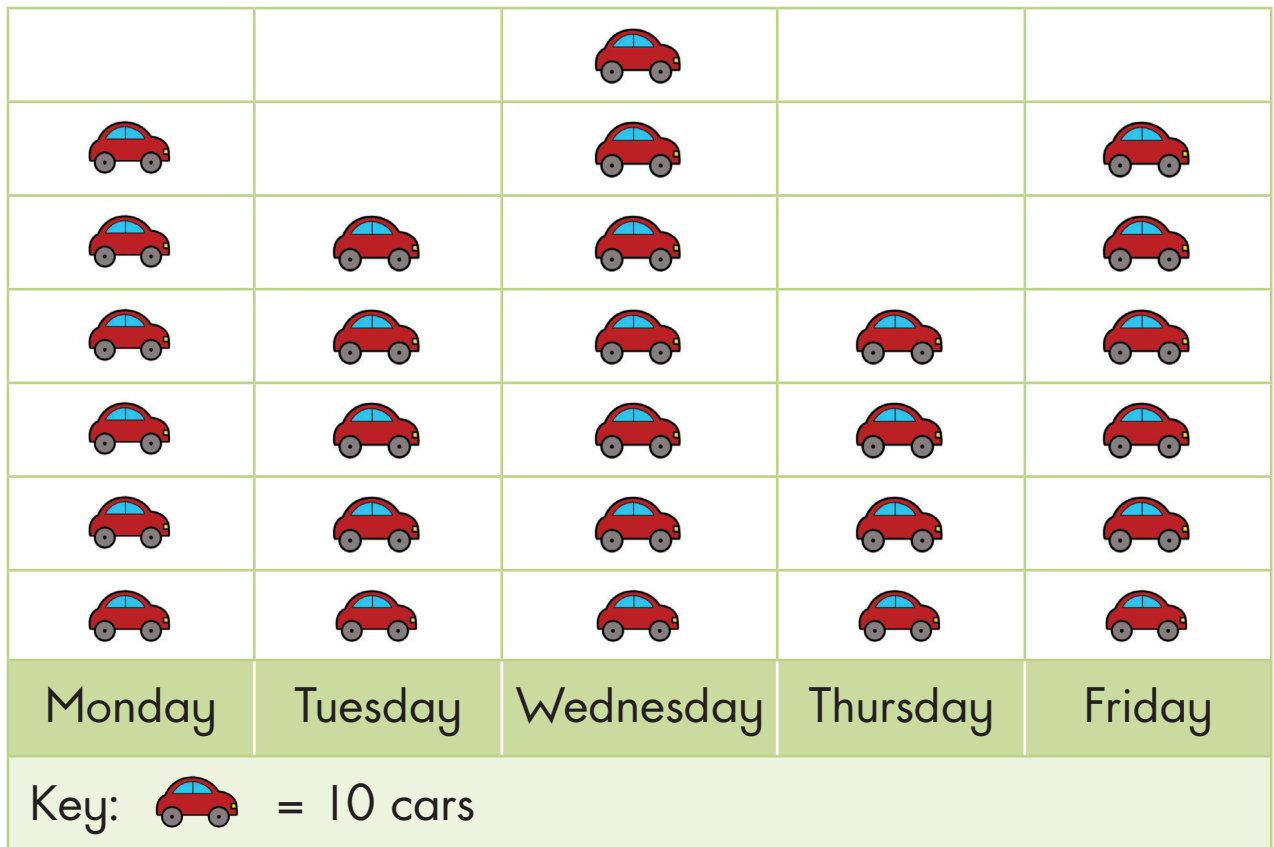
Activity 23

1. Study the graph and then answer the questions that follow:



- Which learners read an equal number of pages?
- Who read the most pages?
- How many pages did Thando read?
- Complete: Zamo read _____ more pages than Thando.

2. Look at the pictograph about the number of cars parked in a car park and answer the questions.


































- On what day were the least number of cars parked at the car park?
- How many cars parked at the car park on Monday?
- What is the difference between the number of cars parked in the car park on Wednesday and Friday?
- How many cars parked in the car park during the week?

3. Look at the pictograph.



- a) In what month did the soccer team score the most goals?
- b) In what month did the soccer team score the least goals?
- c) How many goals did the soccer team score in June and July?
- d) In what months did the soccer team score fewer than ten goals?

4. The pictograph shows 90 learners' favourite vegetables.

Vegetable	Number of learners
Carrots	    
Potato	         
Spinach	     
Pumpkin	   
Cabbage	    
Key  represents three learners	

- What is the most liked vegetable according to the survey?
- What is the second most popular vegetable according to the survey?
- What is the least popular vegetable according to the survey?
- How many learners chose carrots as their favourite vegetable?
- How many learners chose pumpkin or cabbage as their favourite vegetable?
- What vegetable is the favourite of 30 learners?
- Do you agree with this statement: *Carrots are just as popular as cabbage amongst the learners.*

5. The teacher did a survey about the planet learners would like to visit.

Here are the results:

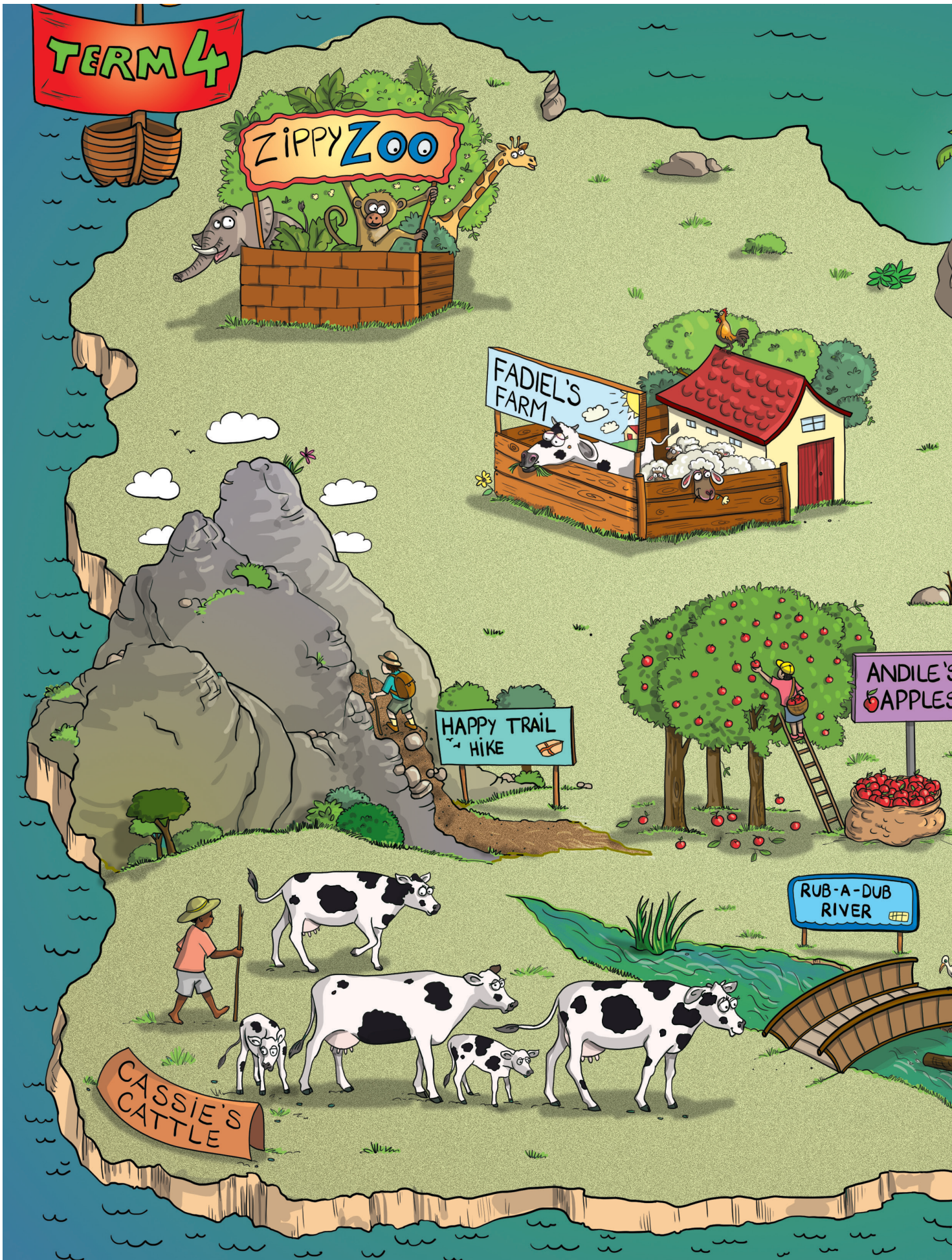
Planets	Amounts
Mercury	///
Venus	/// //
Mars	/// /// //
Jupiter	/// ////
Saturn	/// /// ///
Uranus	///
Neptune	/// ///

- a) Draw a bar graph to represent these results.
- b) Which was the most popular planet to visit?
- c) How many more votes did Venus get than Uranus?
- d) How many more votes did Mars get than Mercury?
- e) Which two planets got the same number of votes.

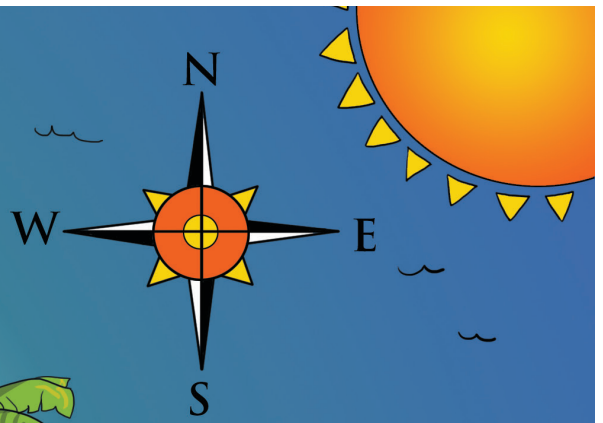
6. Look at the following research topics and choose one to do in your group.

A	Choose five animals and ask each learner to name his or her favourite animal.
B	Choose five different types of chocolates and ask each learner to name his or her favourite one.
C	Choose five types of food and ask each learner to name his or her least favourite one.

- a) Choose a question to ask about the topic you have chosen. For example, which of these five animals is your favourite?
- b) Design a tally table that you can use to collect the data.
- c) Collect the information and organise and summarise the data in a tally table and a bar graph.



We've had lots of fun and learnt lots and lots, both numbers and the world all in all... Now off to a new Mathematics journey!



Number symbols and number names

Note how we write number names greater than 100 to 1 000.

Number symbol	Number names
705	seven hundred and five
920	nine hundred and twenty
844	eight hundred and forty-four

Example

What is the name of the number on this card?

1 000

Answer

One thousand

Example

Read the following numbers aloud and write the number name of the smallest number.

702 720 534 738 978

Answer

Five hundred and thirty-four

Activity 1

1. Read and write the number symbols for these number names:
 - a) Eight hundred and twenty-four
 - b) One thousand
 - c) Forty-nine
 - d) Four hundred
 - e) Seven hundred and eighty-five
 - f) Seven hundred and five
 - g) Nine hundred and nine

2. Write the number name of the number symbol on the card.

a)

284

b)

596

3. Look at the numbers in the grid.

134	245	753
314	774	523
521	632	774

- a) Write the number name of the number greater than 245 but smaller than 521.
- b) Write the number name of the second smallest number in the grid.
- c) Write the number name of the greatest number in the grid.
- d) Write the number name of the number with the place value of: 7 hundreds + 7 tens + 4 ones.

4. Read this note.

My darling Mom

I need to do eight hundred and twenty sums for homework.

I also need to read four hundred and sixty-eight pages.

I only watched television for three hundred and sixty minutes today and played games for one hundred and twenty minutes. Sorry, I could not pick up my six hundred and eighty-five toys.

Lots of love

Your son

One thousand kisses and seven hundred and seven apologies.

- a) Rewrite all the number names as number symbols.
- b) For each number symbol, write a number:
 - (i) 10 greater
 - (ii) 10 smaller
 - (iii) 100 greater
 - (iv) 100 smaller
- c) Write each number symbol using expanded notation.

Example

eight hundred and twenty =

Answer

- 8 hundreds and 2 tens
- $800 + 20$

Counting

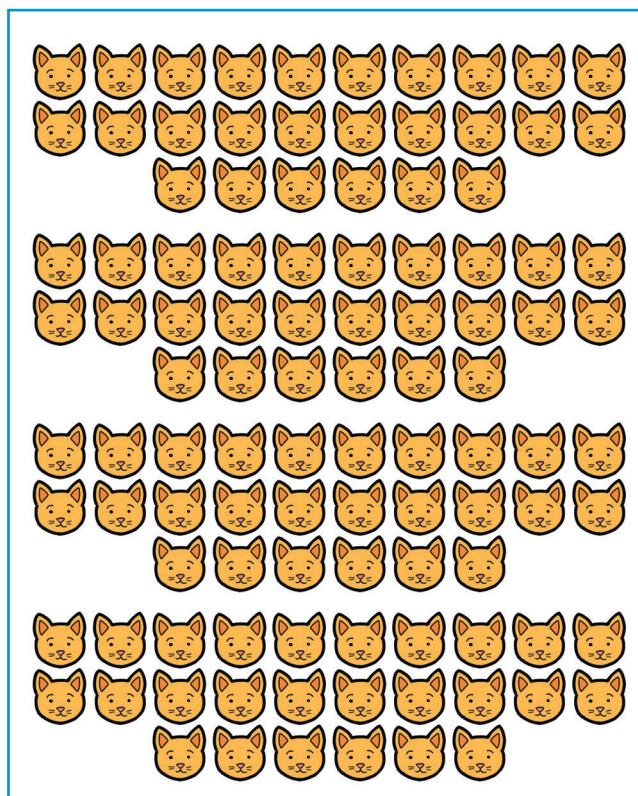
Counting objects

To count at least 1000 objects, we can use a strategy of grouping. We first estimate how many objects to check if the answer is reasonable.

Activity 2

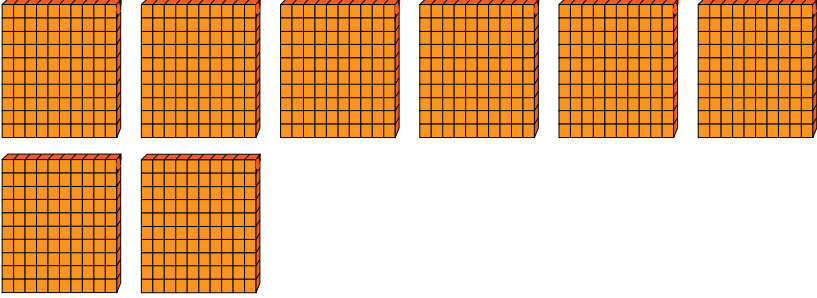
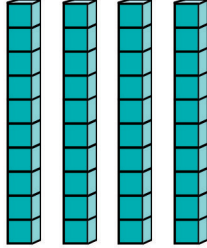
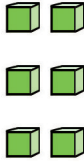
Look at the picture of the cats.

- a) Estimate the number of cats in the picture.
Do not count them.
- b) Count the number of cats by grouping them in groups of threes. Explain to your friend why it is quicker to count in threes than in ones. When will this strategy not give you the correct answer?
- c) Show your friend other counting strategies and explain why it is quicker to count in groups than in ones.
- d) Group the cats in groups of tens. How many groups of tens? How many cats are left? How many cats are there in total?
- e) Group the cats in groups of twenties. How many groups of twenties? How many cats are left? How many cats are there in total?
- f) Explain why you still have the same number of cats.



Example

Look at how the counting blocks are grouped to make counting easier.

		
Hundreds	Tens	Units

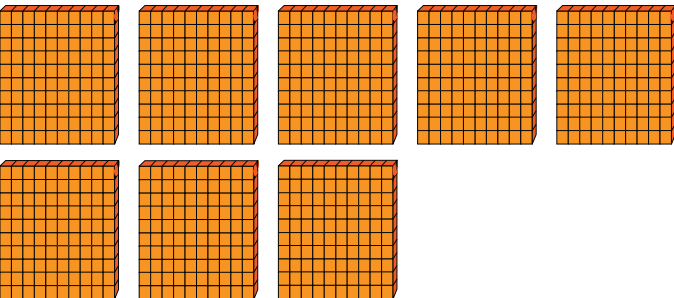
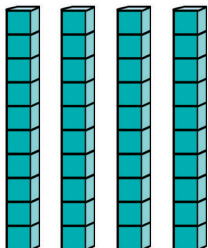
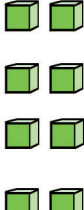
- Write the number symbol represented by the counting blocks.
- Write the number name represented by the counting blocks.

Answer

- 846
- Eight hundred and forty-six

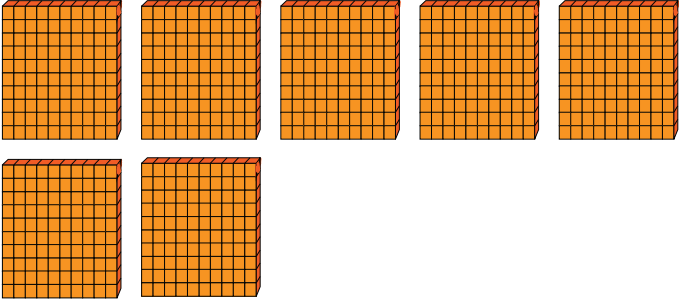
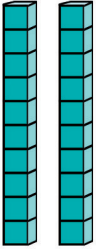
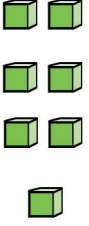
Activity 3

- Look at how the counting blocks have been grouped to make counting easier.

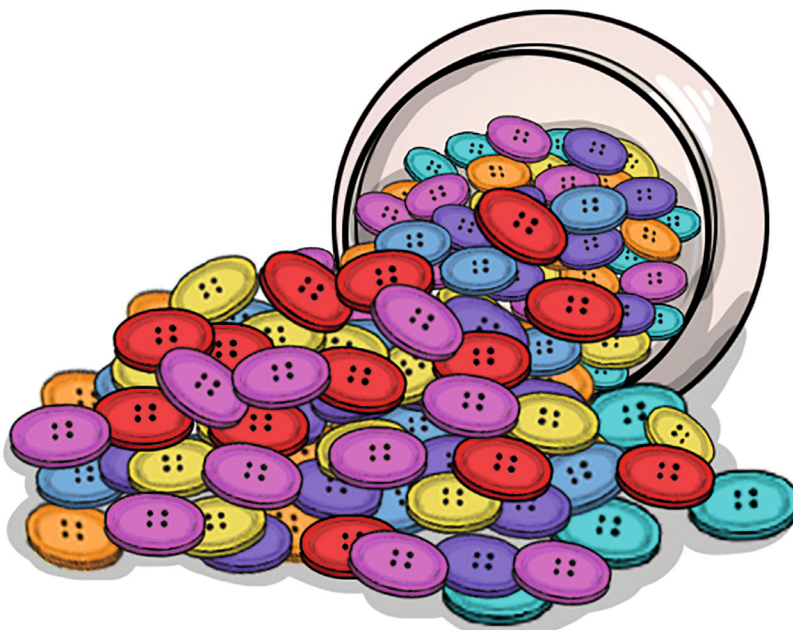
		
Hundreds	Tens	Units

- Write the number symbol represented by the counting blocks.

- b) Write the number name represented by the counting blocks.
2. Look at how the counting blocks have been grouped to make counting easier.

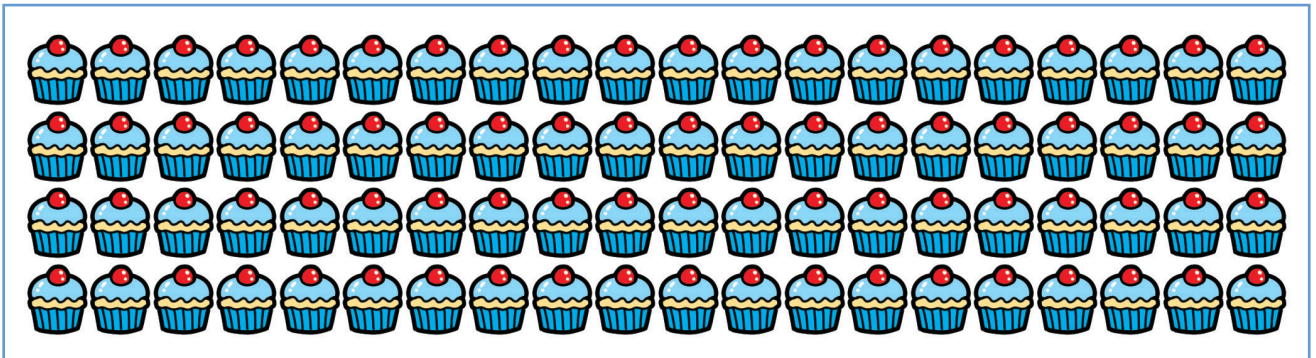
		
Hundreds	Tens	Units

- a) Write the number symbol represented by the counting blocks.
- b) Write the number name represented by the counting blocks.
3. You have estimated that there are about 800 counters, which you need to count. You follow the strategy of grouping the counters in groups. Would you prefer to count them in groups of 10s or 20s? Why?
4. You need to count the number of buttons.



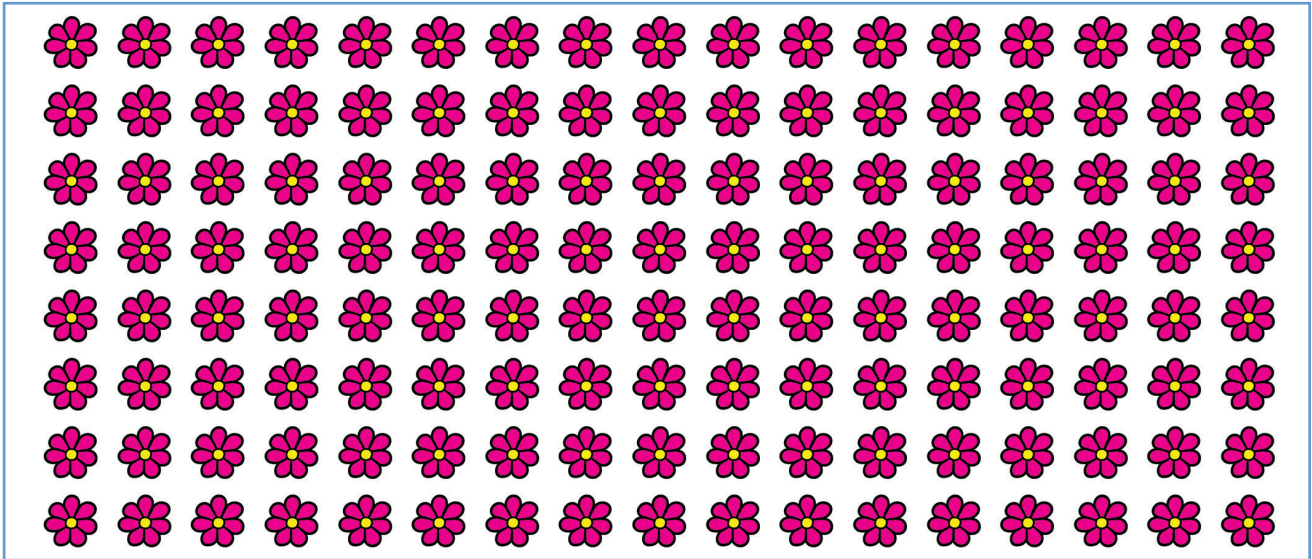
- a) Explain to your friend why you would prefer to count the buttons by grouping them in tens and not twos.
- b) If we count in twos or tens, will the total number of counters still be the same?
Explain why.

5. Here are some cupcakes.



- a) Estimate the number of cupcakes without counting.
- b) To count all the cupcakes would you prefer to count them in groups of 4s or 20s? Why?
- c) Group the cupcakes in groups of twenties. How many groups of twenties? How many cupcakes are left? How many cupcakes are there in total?
- d) Explain to your friend why you would prefer to count the cupcakes by grouping them in twenties rather than to count them in ones.

6. Look at the flowers.



- a) Estimate the number of flowers without counting.
- b) Decide what would be the best way to count the flowers. Give a reason for your decision.
- c) Use your own counting strategy and count how many flowers.
- d) Compare the answers you have worked out by using the different counting strategies to the figures in your estimated answer. Explain why there is a difference.

Count forwards and backwards

When you count forwards the numbers get bigger or greater.

When you count backwards, the numbers get smaller or less.

Example

Start from 1 000 and count backwards in 4s from 1 000 to 960.

Answer

1 000; 996; 992; 988; 984; 980; 976; 972; 968; 964; 960

7. Work with your friend and count in tens from 916 to 976.
- a) Which digits change?
 - b) Which digits do not change?
 - c) Why do the hundreds not change?
 - d) If you count backwards, what happens?

Example

- a) Count forwards in 50s. Start with 50 and end at 900.
- b) How many fifties did you count?

Answer

a)

50	100	150
200	250	300
350	400	450
500	550	600
650	700	750
800	850	900


Take note

Note that it is easier to see a pattern if you list the numbers in a table.

b) 18 fifties

Example

Look at the numbers when you count backwards in 4s from 980. Complete the missing number.

980	976	972	968	964	960	956	
							

Answer

952

Note that all the numbers are even numbers.

Numbers form patterns in ways that make it easier for us to count in multiples and to check them.

Example

- Count forwards in multiples of 3s from 930 to 1 002 and list the numbers in a table to see possible number patterns.
- What do you notice about the multiples of 3s from 930 to 1 002 as listed in the table?

930	933	936	939	942
945	948	951	954	957
960	963	966	969	972
975	978	981	984	987
990	993	993	999	1 002

Answer

- When you count in 3s you skip two numbers each time.
- The multiples of 3s follow a pattern of an even and then an odd number.

Take note

Take note of the rule that in any multiple of 3s, the digits will add up to a multiple of 3.

For example, 993 $\rightarrow 9 + 9 + 3 = 21$

8. a) If you count in 25s from 425 to 950, will you use the number 725? Count and check.
- b) What number comes next after 950 if you count in 25s?
9. Count back in 100s from 820. How many hundreds did you count?
10. Count in fifties from 700 to 900. How many fifties did you count?
11. Count back in ones from 976 to 966. How many ones did you count? How can you make sure that you are correct?
12. a) Look at the grid.

1 000	950	900	850	800	750
700					
400					150

- b) Copy and complete the grid by counting backwards to 150 in 50s, starting from 1 000.
- c) What do you notice about the numbers when you count backwards in 50s, starting from 1 000?
- d) Discuss a strategy showing how you can check if the numbers are correct.
13. a) What number is 20 fewer than 840?
- b) What number is 25 more than 725?
- c) What number is 50 more than 1 000?

14. a) Complete the number grid by counting backwards in 2s.

750	748	746	744	742
740				732
730				722
720				712

- b) How would you describe the numbers in the grid to your friend?
- c) Explain a strategy showing how you can check if the numbers are correct.

15. a) Copy and complete the table by counting backwards in 5s.

800	895	890	885
880	875	870	865

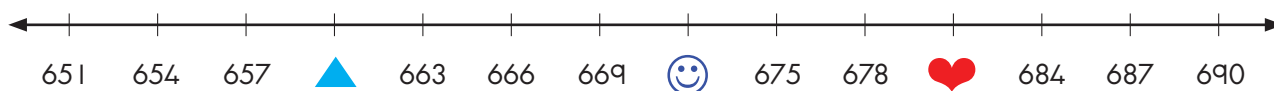
- b) What do you notice about the numbers?
- c) How can you check if you have listed the numbers correctly?




16. Copy and complete the table by counting forwards in 3s starting at 390.

390	393	396	399	402
405				
420				
450	453	456	459	462

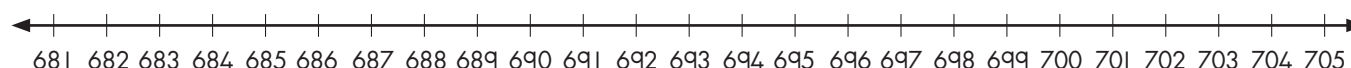
17. Complete by counting forwards in 2s.
- a) 976; 978; ; ; ; 986
- b) 840; 842; ; ; ; ; 452
18. If you count in 25s from 625 to 950 will you use the number 825? Count and check.
19. Count forward 15 steps in 5s from 405. Where are you now?
20. Count in tens from 617 to 677.
- a) Which digits change?
- b) Which digits do not change?
- c) Why do the hundreds not change?
- d) If you count backwards, what happens?

21. Look at the number line that shows how to count forwards in 3s from 651 to 690.



- What number is represented by the ?
- What number is represented by ?
- What number is represented by ?
- Count backwards in 3s from 690 to 651 using the number line.

22. Use the number line to answer the following questions:



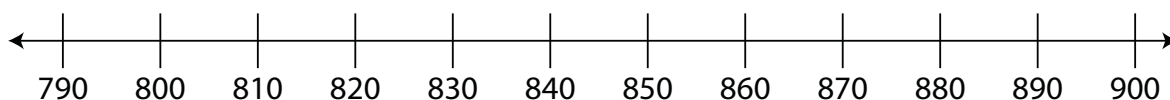
- Count in fives from 685 to 705. How many fives did you count?
 - Count backwards in 2s from 704 to 684. How many 2s did you count?
 - If you count in threes from 681 to 705, will you use the number 696? Count and check.
23. Create three of your own questions counting backwards in 3s from any multiple of 3s between 800 and 1 000. Your questions must have an answer and describe what you notice. Ask your friends to answer your questions.

Describe, compare and order numbers

To compare numbers we look at the greatest values and compare them first.

Activity 4

1. Look at the number line and discuss with your friend how to find the answer to the following questions:



- a) What number is 10 more than 790?
- b) What number is 10 more than 890?
- c) What number is 10 fewer than 850?
- d) What number is 10 fewer than 900?
- e) What number is 20 more than 810?
- f) What number is 20 fewer than 900?
- g) What number is 50 more than 850?
- h) What number is 50 fewer than 870?
- i) What number is 100 more than 790?

Example

Order the numbers from the greatest to the smallest.

926

836

962

863

Answer

962; 926; 863; 836.

2. Order the numbers from big to small.

803 830 899 862 800

3. Use a number grid to answer the following questions.

- a) What number is 1 more than 899?
- b) What number is 1 more than 809?
- c) What number is 10 more than 809?
- d) What number is 100 more than 809?
- e) What number is 1 more than 999?

4. Answer true or false.

- a) 820 is nearer to 800 than 900
- b) 407 is nearer to 400 than 500
- c) 990 is nearer to 1 000 than 900
- d) 780 is smaller than 708

5. Use the digits 9, 0 and 6 to make the greatest number you can.

9

0

6

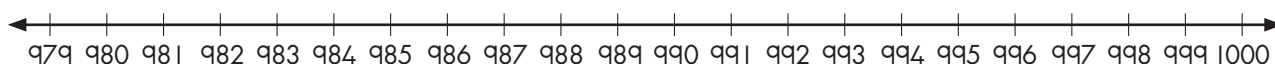
6. Use the digits 8, 1 and 3 to make the smallest number you can.

8

1

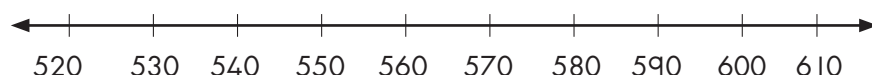
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7. Use the number line to answer the following questions:



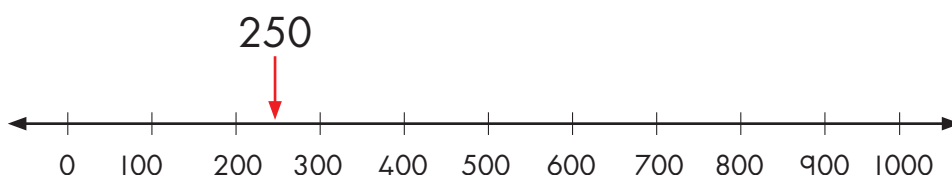
- a) What number is 10 more than 990?
- b) What number is 10 more than 980?
- c) What number is 10 less than 1 000?
- d) What number is 10 less than 990?
- e) What number is 20 more than 980?

8. Use the number line to answer the following questions:



- a) What number is 10 more than 590?
- b) What number is 10 more than 530?
- c) What number is 10 less than 580?
- d) What number is 20 less than 540?
- e) What number is 20 more than 570?
- f) What number is 50 more than 550?
- g) What number is 50 less than 560?

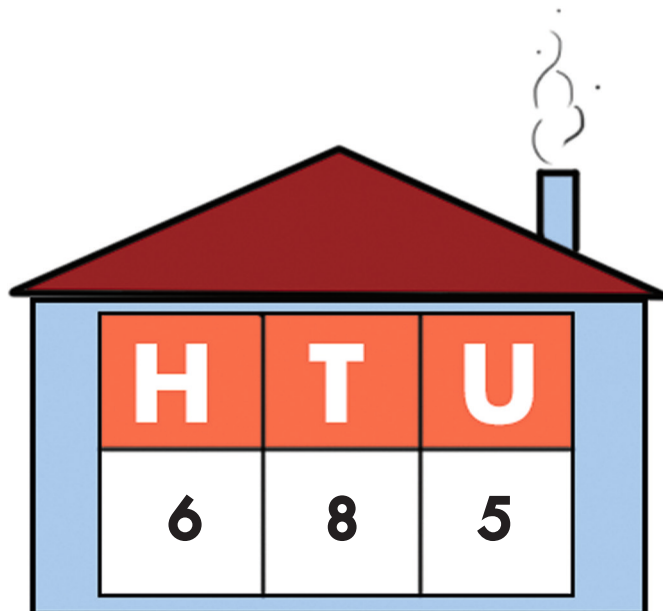
9. Use the number line below to create four of your own questions similar to numbers 7 and 8 of this activity. Provide the answers and explain how you can check if they are correct.



Place value

Three-digit numbers can be broken down into hundreds, tens and ones.

Look at the number house for 685.



We can break down $685 = 6 \text{ hundreds} + 8 \text{ tens} + 5 \text{ units}$
 $= 600 + 80 + 5$.

Example

- a) Write the number 953 in words.
- b) Write 953 using expanded notation.

Answer

- a) $953 = \text{nine hundred and fifty-three}$
- b) $953 = 9 \text{ hundreds} + 5 \text{ tens} + 3 \text{ units}$
 $= 900 + 50 + 3$

Example

Explain why 61 is greater than 16.

Answer

61 has 6 groups of tens and 16 only has one group of tens.

Example

What is the value of the underlined digit?

964

Answer

The value of the 6 is sixty.

Example

What is the value of the underlined digit?

887

Answer

The value of the 7 is seven.

Example

What is the value of the underlined digit?

909

Answer

The value of the 9 is nine hundred.

Activity 5

1. Copy and complete.

	Number symbol	Expanded notation
a)	675	
b)	434	
c)		$700 + 60 + 8$
d)		$900 + 50 + 8$
e)	848	
f)		$700 + 60 + 6$
g)	920	$900 + 20$

2. Complete

a) $665 = 600 + \square + 5$

b) $828 = 800 + \square + 8$

c) $976 = \square + 70 + 6$

3. Look at the number

809

a) How many hundreds in the number?

b) How many tens in the number?

c) Why do we write the 0? Why do we not write 89?

4. Complete the table. (Do not draw the blocks.)

	Visual presentation	Place value parts	Number symbol
E.g.		$100 + 10 + 3$	113
a)			
b)			
c)			
d)			
e)			
f)			

5. How many bundles of tens are there in each of the following numbers?

a) 884

b) 413

c) 567

d) 301

6. How many hundreds are there in each of the following numbers?

a) 600

b) 911

c) 767

d) 341

7. Complete the table.

	Place value parts	Number symbol
E.g.	$800 + 80 + 8$	888
a)	6 hundreds and 4 tens	
b)	8 hundreds and 4 tens and 6 ones	
c)	9 hundreds + 9 tens + 5 ones	
d)	6 hundreds + 4 tens + 7 ones	
e)	7 hundreds + 7 ones	
f)	5 hundreds + 4 ones	
g)	8 hundreds + 7 tens	

8. Write the numbers made with each set of cards. Look at the example.

Example

900

50

8

$900 + 50 + 8$
= 958

a)

800

40

6

b)

500

60

9

c)

800

40

4

d)

600

80




3

9. What is $90 + 600 + 7$

10. Break down the number 854 into hundreds, tens and units.



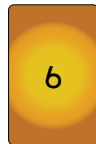
11. Put the cards together and write the number.



Example



  




$900 + 50 + 3$
 $= 953$




a)  

b)   


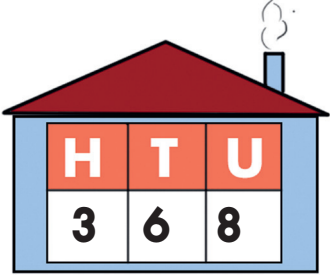
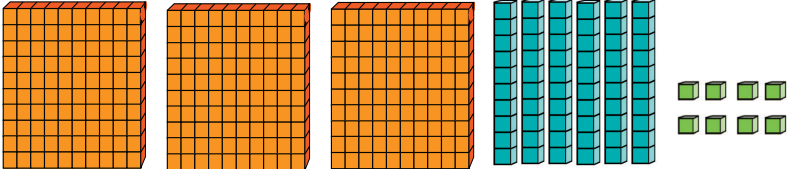
c)  

d)  

e)   

f)   

12. Thandeka's favourite number is 368. Look at how she used her place value knowledge to create a poster about her favourite number.

Thandeka's favourite number	Expanded notation	Number house
	368 $= 3 \text{ hundreds} + 6 \text{ tens} + 8 \text{ ones}$ $= 300 + 60 + 8$	
<p>The digit 3 in 368 represents 300.</p> <p>The digit 6 in 368 represents 60.</p> <p>The digit 8 in 368 represents 8.</p>		<p>Take note</p> <p>10 more than 368 is 378</p> <p>10 less than 368 is 358</p> <p>100 more than 368 is 468</p> <p>100 less than 368 is 268</p>
<p>Visual presentation</p> 		

Choose your favourite number greater than 500 but smaller than 1 000. Create your own poster like Thandeka's poster.

Addition and subtraction

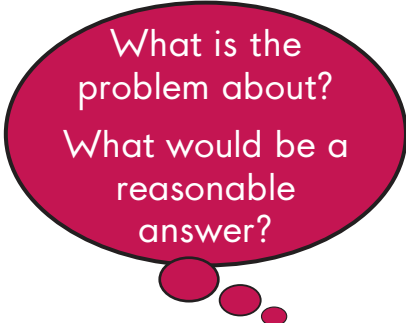
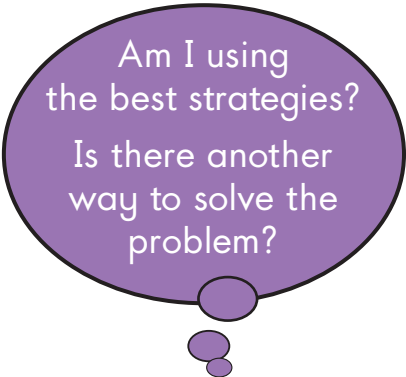
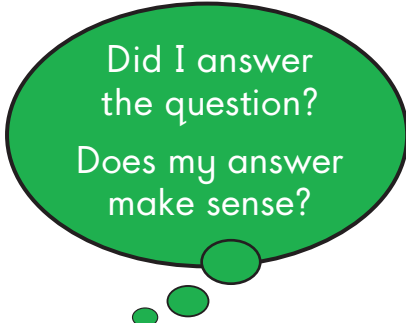
In this unit we will focus on solving different kinds of word problems involving addition and subtraction for answers up to 999.

Read and reread the problem to convert a word problem into a number sentence. We can use a to show an unknown number.

Underline the keywords and study the table to ensure you use the correct operation.

Key words for addition and subtraction in word problems	
Addition	Subtraction
altogether	change
combined	decreased by
entire cost	difference
in all	fewer
increased by	how much left
more	how much less
more than	how many fewer
plus	how much more
sum	how much saved
total	how much taller
total cost	less than
	minus

How to solve problems

Plan	Solve	Check
<p>Read and visualise. Reread and underline and box keywords. Sketch and predict.</p> 	<p>Show a number sentence. Show my strategy. Show my thinking.</p> 	<p>Check my work. Go back to the question. Answer in complete sentence.</p> 

Example

Find the difference between 900 and 530.

Answer

$$\begin{aligned}
 900 - 530 &= \square \\
 &= 900 - (500 + 30) \\
 &= (900 - 500) - 30 \\
 &= 400 - 30 \\
 &= 370
 \end{aligned}$$

Example

What is 20 less than 968?

Answer

$$968 - 20 = \square$$

$$968 - 20 = 948$$

Example

Find the sum of 988 and 3.

Answer

Method 1

Add by counting on in ones because the numbers are close to each other.

$$988 + 3 = \square$$

$$988 + 3 = 991$$

Will Method 1 or Method 2 be the most efficient method?

Discuss with your friend which method you prefer to use and give a reason.

Method 2

Add by breaking down one number.

$$988 + 3 = \square$$

$$= (900 + 80 + 8) + 3$$

$$= 900 + 80 + (8 + 3)$$

$$= 900 + 80 + 11$$

$$= 900 + (80 + 10) + 1$$

$$= 900 + 90 + 1$$

$$= 991$$

Example

Add 16 to 725.

Answer**Method 1**

Use halving to break down the number.

$$725 + 16 = \square$$

$$725 + 10 + 6$$

$$= (725 + 10) + 6$$

$$= 735 + 6$$

$$= 741$$

We break down the number 16 into 10 and 6.

It is easier to add 10 and then 6 than to add 16.

Method 2

Add by breaking down both numbers.

$$725 + 16 = \square$$

$$= (700 + 20 + 5) + (10 + 6)$$

$$= 700 + (20 + 10) + (5 + 6)$$

$$= 700 + 30 + 11$$

$$= 700 + (30 + 10) + 1$$

$$= 700 + 40 + 1$$

$$= 741$$

Example

What number is 9 more than 688?

Method

Count up to the nearest 10.

Answer

$$688 + 9 = \square$$

$$688 + 10 = 698$$

$$698 - 1 = 697$$

$$688 + 9 = 697$$

Example

Find the sum of 445 and 446.

Method

We identify near doubles as a strategy as the two numbers are very close.

Answer

Method 1

Double 445 plus 1

$$445 + 445 + 1$$

$$= 890 + 1$$

$$= 891$$

Method 2

Double 446 minus 1

$$446 + 446 - 1$$

$$= 892 - 1$$

$$= 891$$

Example

Find the difference between 889 and 237.

Answer**Method 1**

Subtract by breaking down both numbers.

$$889 - 237 = \square$$

$$= (800 + 80 + 9) - (200 + 30 + 7)$$

$$= (800 - 200) + (80 - 30) + (9 - 7)$$

$$= 600 + 50 + 2$$

$$= 652$$

Method 2

Subtract by breaking down one number.

$$889 - 237 = \square$$

$$= 889 - (200 + 30 + 7)$$

$$889 - 200 \rightarrow 689$$

$$689 - 30 \rightarrow 659$$

$$659 - 7 \rightarrow 652$$

Example

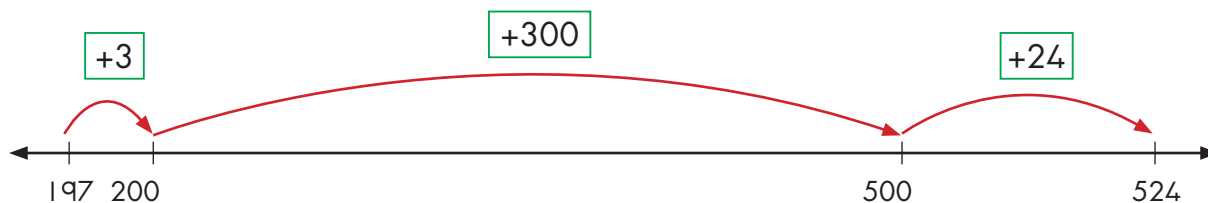
Find the difference between 524 and 197.

Answer

Method 1

Use a number line and count.

$$524 - 197 = \square$$



$$\begin{aligned} &= 3 + 300 + 24 \\ &= 327 \end{aligned}$$

Note $524 - 197 = 327$ implies that $524 - 327 = 197$

Method 2

Breaking down a number using multiples of 10.

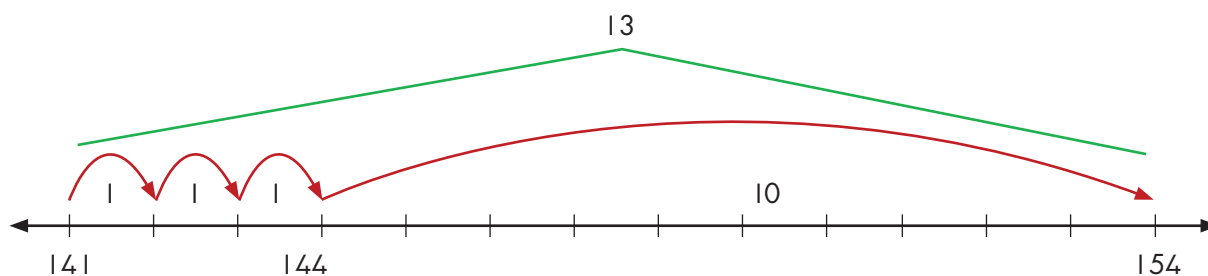
$$524 - 197 = \square$$

$$\begin{aligned} &(524 - 200) + 3 \\ &= 324 + 3 \\ &= 327 \end{aligned}$$

Check the answer by using the relationship between addition and subtraction: $327 + 197 = 524$

Example

Use the number line to show that addition is the opposite of subtraction.



Answer

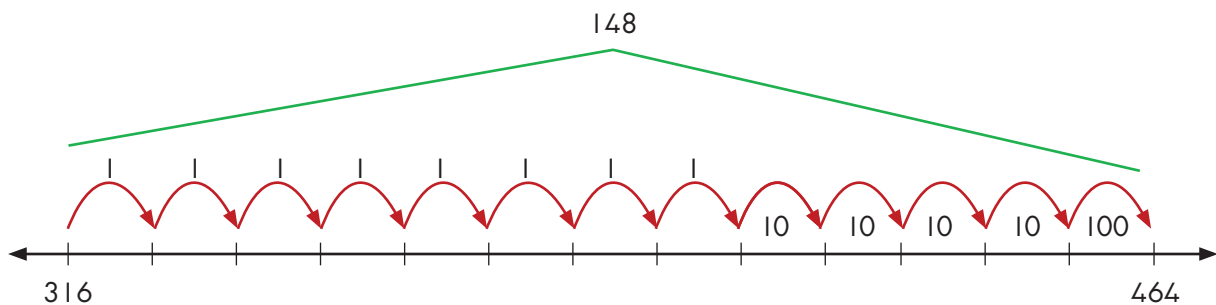
$$154 - 13 = 141$$

$$141 + 13 = 154$$

The addition sentence is the opposite of the subtraction sentence.

Example

Write four number sentences using the number line:

**Answer**

$$316 + 148 = 464$$

$$148 + 316 = 464$$

$$464 - 316 = 148$$

$$464 - 148 = 316$$

We can use opposite operations to check the answer to an addition or subtraction problem.

Example

We can check the addition of $450 + 250 = 700$ by using subtraction: 700.

Answer

We can check the subtraction of $800 - 300 = 500$ by using addition: $500 + 300$.

Activity 6

Work with your friend to identify the keywords in the word problems.

- I. Explain to your friend how the word problem is converted to a number sentence.

	Word problem	Number sentence
a)	Noluthando collected 236 newspapers for recycling. Silas gave her 70 more newspapers. How many newspapers does she have altogether?	$236 + 70 = \square$
b)	There were 600 passengers in a train. If 276 passengers got off, how many passengers are left on the train?	$600 - 276 = \square$
c)	Rufus collects items for the school's recycling project. He collected 122 plastic bottles and 244 cans. How many items did he collect in total?	$122 + 244 = \square$
d)	The shop has 358 cans of fruit. 82 are pears and the rest are peaches. How many cans of peaches are there?	$358 - 82 = \square$

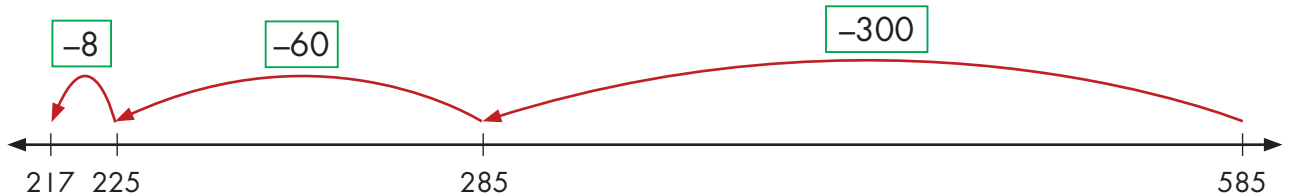
e)	Zinzi collected R244 for a charity. Zola collected R620. How much more money did Zola collect?	$620 - 244 = \square$
f)	The shop had some packets of chips. 55 more packets were ordered. There are now 420 packets of chips. How many packets were there to start off with?	$420 - 55 = \square$
g)	The shop had 500 bottles of cooldrink. After selling some bottles, they had 326 bottles of cooldrink left. How many bottles of cooldrink did they sell?	$500 - 326 = \square$

2. Write a number sentence for the following problems:

- a) Add 250 and 750.
- b) Take 50 from 280.
- c) What is the difference between 733 and 103?
- d) What number must we add to 60 to get 500?
- e) What number is 9 less than 789?
- f) What number is twenty more than 780?
- g) Find the difference between 789 and 259.
- h) What number is ten less than 868?
- i) What number is 80 less than 888?
- j) Add zero to 660.
- k) Double 250.

3. Solve the following problems:
- a) Add together 243 and 119.
 - b) Subtract 40 from 290.
 - c) Add ten to 767.
 - d) Subtract zero from 1 000.
 - e) Add 150 and 270.
 - f) What is 30 more than 660?
 - g) Add forty to two hundred and seventy-five.
 - h) What number is ten more than 683?
 - i) What must you add to 60 to make 270?
 - j) Find the sum of 256 and 114.
4. You know: $145 + 125 = 270$
- a) What is $125 + 145$?
 - b) What is $270 - 145$?
 - c) What is $270 - 125$?
5. You know: $154 - 121 = 33$
- a) What is $154 - 33$?
 - b) What is $121 + 33$?
 - c) What is $33 + 121$?
6. Complete the following statements:
- a) $300 - 50 = \square$ therefore $50 + \square = 300$
 - b) $154 - 32 = \square$ therefore $32 + \square = 154$

7. You need to determine the difference between 585 and 368.
- Write a number sentence for the problem.
 - Use the number line given to determine the difference between 585 and 368.

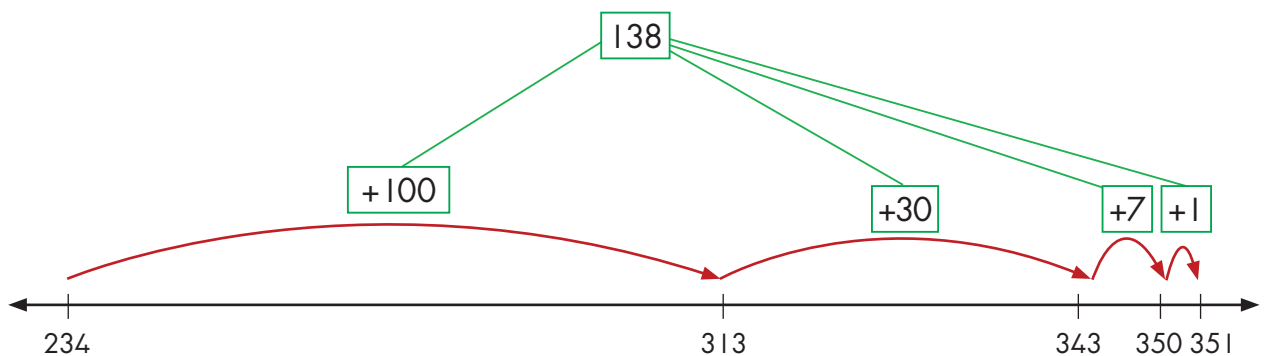


- Check the answer by using any method. Explain why it is important to check the answer.
8. Look at the problem.

What is the difference between 351 and 213?

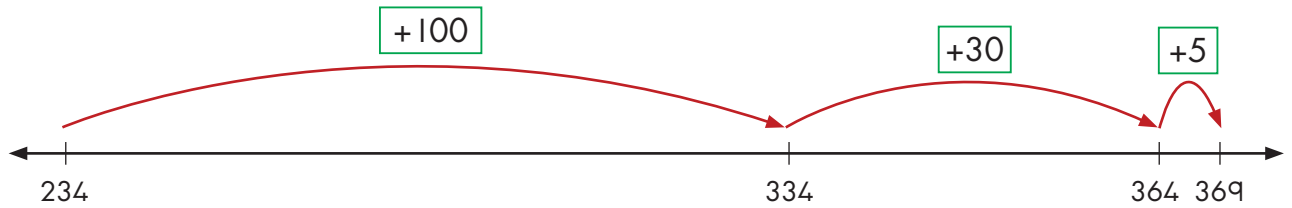
- Write a number sentence for the problem.
- Explain how you can use the number line to solve the problem.

Combine all the jumps
 $100 + 30 + 7 + 1$

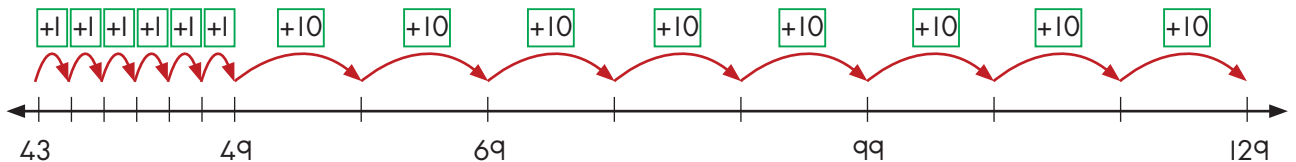


- Use any other technique to solve the problem.
- How can you check your answer?

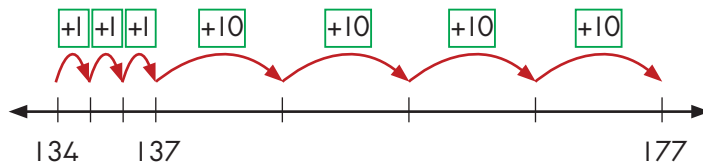
9. Write four number sentences using the number line:



10. Write four number sentences using the number line:



11. Write four number sentences using the number line:



12. Write four number sentences using these numbers:
140; 120

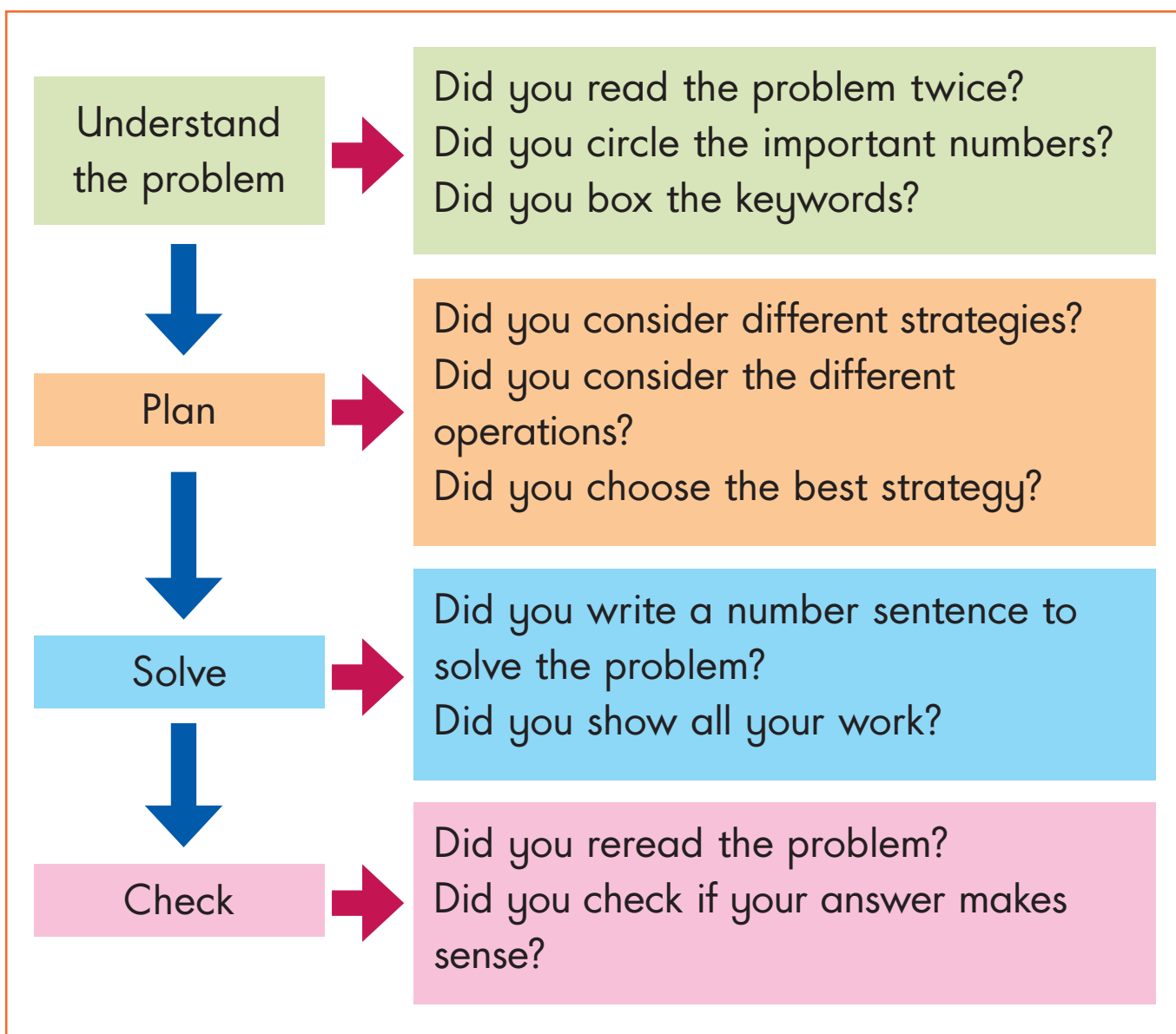
13. a) Find 10 pairs of numbers with a difference of 50.
b) Find 10 pairs of numbers with a difference of 100.
c) Find 5 pairs of numbers with a difference of 200.

Problem-solving techniques

We can use these different techniques when solving problems in Mathematics:

- Building up and breaking down numbers
- Doubling and halving
- Number lines
- Rounding off in tens

Use these steps and ask these questions when you solve problems in Mathematics.



Example

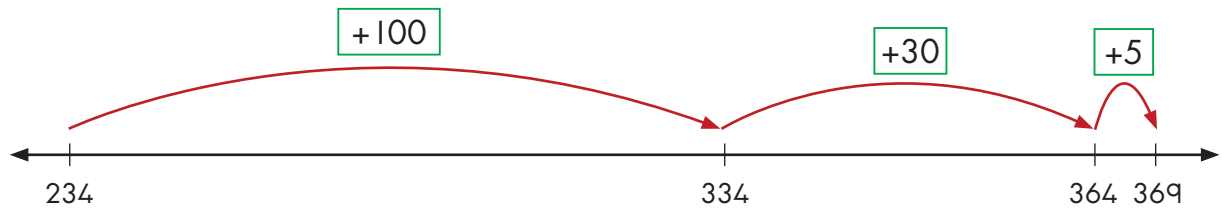
You climbed 234 stairs and then another 135 stairs. Use the number line to calculate how many stairs you climbed in total.

Answer

Number sentence: $234 + 135 = \square$

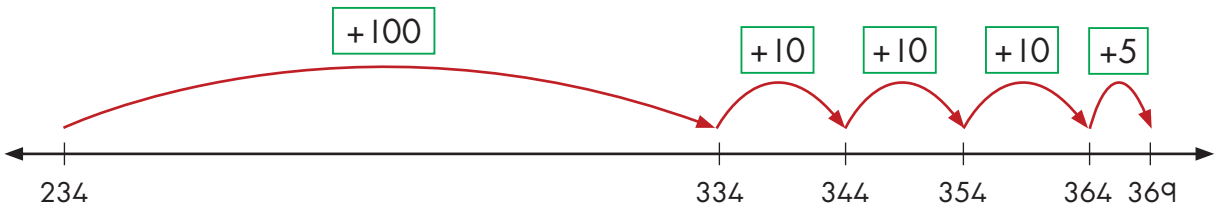
Start from 234 and jump 100 units to 334. Then jump 30 units to 364, and 5 units to 369.

Method 1



$$234 + 135 = 369$$

Method 2



$$234 + 135 = 369$$

You climbed 369 stairs in total.

Start from 234 and jump 100 units to 334. Then jump 10 units three times to 364, and 5 units to 369.

Check

Use estimation by rounding off to the nearest 10 to check if it is close to the answer.

$$234 \rightarrow 230$$

$$135 \rightarrow 140 \quad 369 \rightarrow 370$$

$$230 + 140 = 370$$

Your estimate is close to 369.

Example

A shop had 500 soccer balls. After selling some balls, they had 322 balls left. How many balls did they sell?



Use three different techniques to solve this problem.

Answer

Technique	Calculation
Subtract by breaking down numbers	$ \begin{aligned} &500 - 322 \\ &= 500 - (300 + 20 + 2) \\ &= 500 - 300 - (20 + 2) \\ &= 200 - (20 + 2) \\ &= (200 - 20) - 2 \\ &= 180 - 2 \\ &= 178 \end{aligned} $
Number lines	$500 - 300 - 20 - 2 = 178$
Rounding off in tens	$ \begin{aligned} &500 - 320 && \text{Round 322 off to 320 and subtract it from 500.} \\ &= 180 \\ &180 - 2 && \text{Subtract 2 to compensate for the 2 you lose when rounded off.} \\ &= 178 \end{aligned} $

When you solve a problem, you can choose the technique you know best to solve your problem. Make sure your technique is the best technique to solve your problem. Check your answer to a problem by using a different technique.

Doubling is the same as multiplying by 2, so any method that works for multiplying by 2 also works for doubling.

Halving is the same as dividing by 2, so any method that works for dividing by 2 also works for halving.

Example

On Saturday 340 pizzas were ordered and on Sunday 342 pizzas were ordered from Pumi's Pizza Place. How many pizzas were ordered during the weekend?



Answer

Number sentence: $340 + 342 = \square$

The quickest way to solve the problem is to use the doubling technique.

Method 1

Double 340 plus 2
 $= 680 + 2$
 $= 682$

Method 2

Double 342 minus 2
 $= 684 - 2$
 $= 682$

682 pizzas were ordered altogether during the weekend.

Check

Round off the numbers to the nearest ten and check if the answers are close.

$$340 + 340 = 680$$

Example

Zach has R596. The spinners he collects costs R50 each. How many spinners can Zach buy?

**Answer**

Number sentence: $596 \div 50$

The most efficient way to solve the problem is to round off R590 to the nearest ten, which is R600.

Zach is close to being able to buy 12 spinners.

Example

Sihle has R543 and spends R387. How much money does Sihle have left?

Answer**Understand**

Read, then reread the problem
Circle the numbers and box the key words.

Sihle has R543 and spends R387.
How much money does Sihle have left?

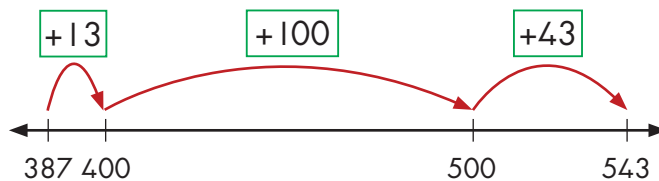
Plan

Choose a strategy.

Number sentence:
 $543 - 387$
Use the strategy of jumping on a number line to determine the answer.

Do

Solve the problem.



Start at 387 and jump to 400.

Then jump to 500 and then jump to 543.

Add the jumps: $13 + 100 + 43 = 156$

$543 - 387 = 156$

Check

Explain the answer.

Check the answer by using estimation

$540 - 390 = 150$

Round off the numbers to the nearest ten and subtract. The estimation is reasonably close to the answer.

Answer the question as a sentence.

Sihle has R156 left.

Activity 7

1. Neo has R450 and spends R380. How much money does Neo have left? Solve the problem by using a number line.



2. Sia scored 387 and 339 when playing a computer game. Find the difference between 387 and 339.
- a) Write a number sentence for the problem you need to solve.
 - b) Put both numbers on a number line to find the difference between them. Use a number line to solve the problem.
 - c) Describe two techniques you can use to check your answer.
3. Rachel travelled 374 km and Anika travelled 357 km to attend a function. Answer the questions that follow to determine the difference in distance travelled by Rachel and Anika.
- a) Write a number sentence to solve the problem.
 - b) Use a number line to solve the problem.
 - c) Choose any other technique you are comfortable with to solve the problem.
 - d) Explain why and how you will check the answer to the problem.
4. Jude has R38 and his favourite sweets cost R5 each. How many sweets can he buy?

5. Max did 253 sums on Friday and 39 sums on Saturday to prepare for the Maths test. How many sums did Max do in total?



$$2 + 2 + 2 = 2 \times 3 = 6$$

Look at the technique used to solve the problem.

Number sentence	$253 + 139$
Plan	Most efficient method: Round off to the nearest 10 and subtract 1
Do	$\begin{aligned} &253 + 139 \\ &= (253 + 140) - 1 \\ &= 393 - 1 \\ &= 392 \end{aligned}$

- a) Use rounding off to the nearest 10 to check if the calculation is correct. Remember that when you use estimation, the answers must not be the same but reasonably close to each other.
- b) Use two other techniques that you can use to solve the problem.

6. Thandi reads 320 pages in Week 1 and 321 pages in Week 2.

Calculate how many pages Thandi read altogether.



Thandi read: $321 + 320 = \square$

- Explain why the doubling technique will be the most efficient method to solve the problem.
 - Use any technique to solve the problem.
 - Explain how you will check the answer to the problem.
7. Look at the lengths of some rivers in South Africa.

River	Length	Province
Olifants	560 km	Mpumalanga and Limpopo
Nossob	740 km	Northern Cape
Great Fish	696 km	Eastern Cape
Apies	16 km	Gauteng

Gamtoos	645 km	Eastern Cape
Molopo	960 km	North West
Great Kei	520 km	Eastern Cape
Tugela	947 km	KwaZulu-Natal

- a) Which river is the longest river?
- b) What is the name of the second longest river?
- c) Order the length of the rivers in the Eastern Cape and in Northern Cape from longest to shortest.
- d) Which river will be 700 km long if you rounded it off to the nearest 10?
- e) Write a number sentence to find the difference in length between the Molopo River and the Olifants River.
- f) Write a number sentence to determine the total length of the Apies River and the Great Fish River. Calculate the total length of these two rivers.
- g) Determine the difference in length between the Tugela River and the Gamtoos River.
- h) David says that the difference in length between the Great Fish River and the Gamtoos River is 150 km. Use estimation, by rounding off the numbers to the nearest 10, to show that David's answer is not correct.

- i) Cindy says that the total length of the Groot Kei River and the Olifants River is 1 080 km. What problem-solving technique will you use to check Cindy's answer? Explain why you chose that technique.



The Orange River is the longest river in South Africa. It is estimated to be about 2 200 km long.

8. Zach has done 353 sit-ups in Week 3 and 350 sit-ups in Week 4 to prepare for a soccer match. How many sit-ups did Zach do in total?



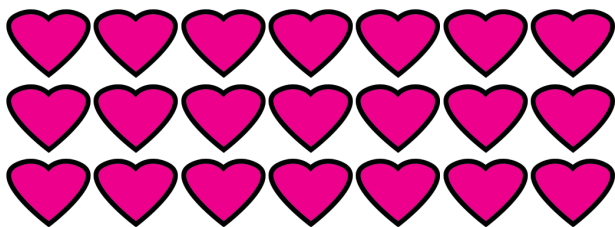
- a) Write a number sentence for the problem.
 - b) Explain to your friend two strategies to solve the problem.
 - c) Explain what strategy will be the quickest way to solve the problem.
 - d) Use the best strategy to solve the problem.
 - e) Explain to your friend how to check the answer to the problem.
9. Create five of your own word problems.
- a) Write a number sentence for each of the problems.
 - b) Explain which technique will be the most efficient method to solve each of the problems you created.
 - c) Use the most efficient problem-solving technique to solve two of the problems you created.

Repeated addition leading to multiplication

In this unit we will focus on how repeated addition leads to multiplication.

Example

Use the array of 3 rows of 7 hearts to explain how repeated addition is connected to multiplication. Use the array and the number sentences to guide the discussion.



$$3 \times 7 = 21$$

$$7 \times 3 = 21$$

Seven groups added together
3 times is the same as:

$$7 + 7 + 7 = 21$$

$$3 \text{ lots of } 7 = 21$$

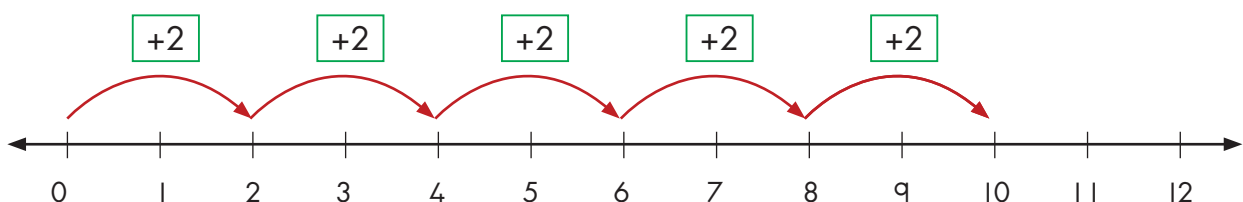
$$3 \text{ times } 7 = 21$$

Activity 8

- I. Create your own array to represent 24.
 - a) Use the array to create four different number sentences.
 - b) Explain how to link repeated addition and multiplication.

Example

Write the repeated addition and multiplication number sentence represented by the number line.



Answer

Repeated addition	$2 + 2 + 2 + 2 + 2 = 10$
Multiplication	$5 \times 2 = 10$

Example

Each cake has nine candles. How many candles on three cakes? Solve the problem using repeated addition and multiplication.



Answer

Repeated addition	$9 + 9 + 9 = 27$
Multiplication	$9 \times 3 = 27$

Example

Here are 9 boxes of pencils. Each box has 10 pencils. How many pencils are there in total?



Solve the problem using repeated addition and multiplication number sentences.

Answer

Repeated addition	$10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 + 10 = 90$
Multiplication	$10 \times 9 = 90$

Activity 9

1. How many legs do these dogs have altogether? Solve the problem using repeated addition and multiplication.



2. Mr Zwane plants 20 rows of apple trees. There are 9 trees in each row.



- a) How many trees are there altogether?
- b) There are six apples in a tree. How many apples are there in one row of nine trees?
3. Each cake has eight candles. How many candles on five cakes altogether?
- Solve the problem using repeated addition and multiplication.



4. Pule sells doughnuts for R4 each.

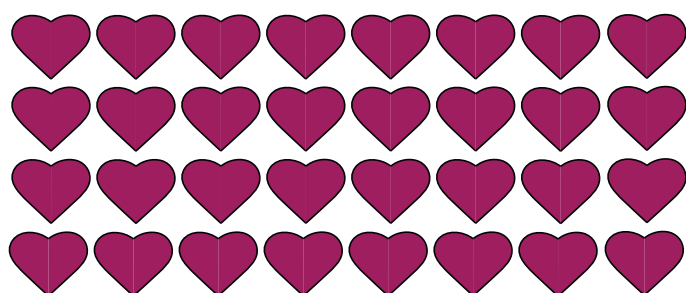


- a) Copy and complete the table to help Pule find the amount she needs to charge for large orders.

Number of doughnuts	1	2	3	4	10	20	50	100
Price in Rand	R4	R8	R12					

- b) Use the table to find the price of 4 doughnuts.
- c) Use the table to find the price of 20 doughnuts.
- d) Use the table to find the price of 170 doughnuts.

5. Use the array to write two addition and two multiplication number sentences.



Copy and complete:

- a) 5 groups of 4 = $5 \times 4 =$
- b) Double 8 = $2 \times 8 =$
- c) 6 lots of 3 = $6 \times 3 =$
- d) 5 groups of 7 = $5 \times 7 =$
- e) Triple 7 = $3 \times 7 =$

6. Each car has four wheels

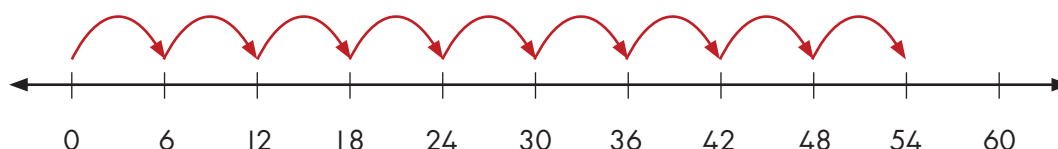


a) Complete the table.

	How many wheels	Repeated addition	Multiplication
E.g.	Seven cars	$4 + 4 + 4 + 4 + 4 + 4 + 4 = 28$	$4 \times 7 = 28$
(i)	Two cars		
(ii)	Three cars		
(iii)	Four cars		
(iv)	Five cars		
(v)	Six cars		

b) Show the number of wheels on a number line.

7. Look at the number line with nine equal jumps:



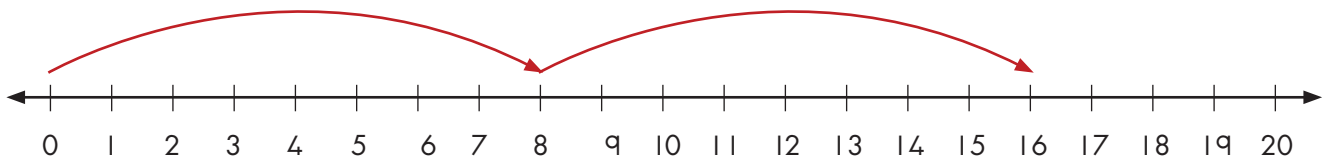
a) Write an addition number sentence that is represented by the number line.

b) Write a multiplication number sentence that is represented by the number line.

8. Each pack has 3 pens. How many pens are there in eight packs?

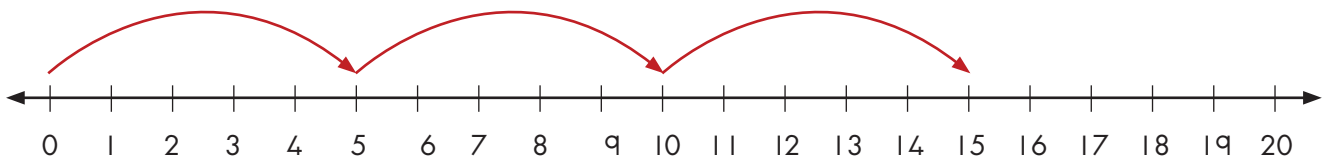


9. Look at the number line with two equal jumps:



- Write an addition number sentence that is represented by the number line.
- Write a multiplication number sentence that is represented by the number line.

10. Look at the number line with three equal jumps:



- Write an addition number sentence that is represented by the number line.
- Write a multiplication number sentence that is represented by the number line.
- Explain why the answers to a) and b) are the same although you used different methods.

- II. Read the problem:

Each pack has 8 pencils. How many pencils are there in three packs?



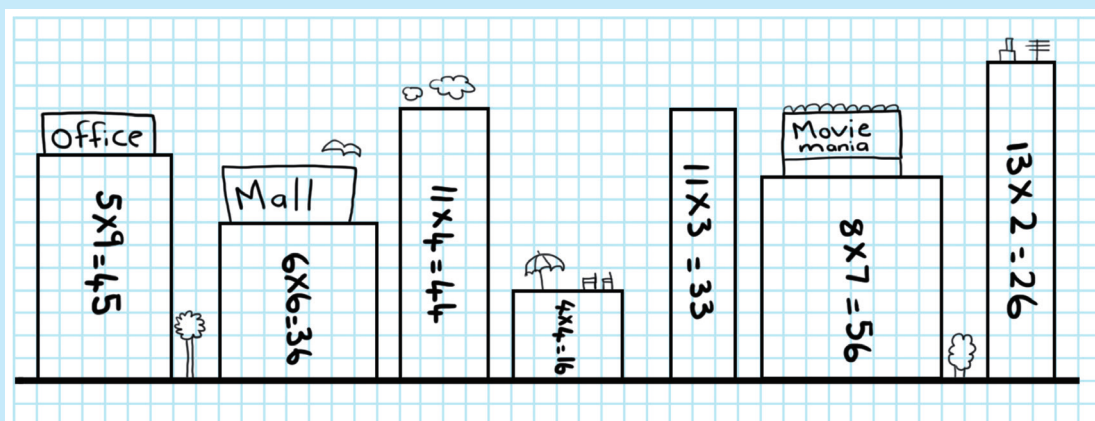
- Solve the problem by using repeated addition.
- Solve the problem by writing it as a multiplication number sentence.

- c) Solve the problem by using a number line.
 - d) Explain what technique is the quickest way for you to solve the problem.
8. Hazel saves 50c every week. How much money does she save in 9 weeks?

Project

Create your own city skyline out of arrays. Use quad paper for the buildings and write the multiplication number sentence on each building. Your skyline must have at least eight buildings of different heights. Name the different buildings, and decorate your skyline. Put your name on the top left-hand corner.

Use this city skyline as an example.



Grouping and sharing leading to division

In this unit we will solve practical problems that involve equal sharing and grouping up to 200 with answers that may include remainders.

Keywords in problems that involve division

Same	Half	Split
Equal group	Separate	Divided by
Shared equally	Distribute	Cut up

Example

Share 180 sweets equally amongst five girls.

Answer

Number sentence $180 \div 5 = \square$

$$\begin{aligned} &180 \div 5 \\ &= (150 + 30) \div 5 \\ &= (150 \div 5) + (30 \div 5) \\ &= 30 + 6 \\ &= 36 \end{aligned}$$

Check the answer:

$$\begin{aligned} 36 \times 5 &= (30 \times 5) + (6 \times 5) \\ &= 150 + 30 = 180 \end{aligned}$$

Answer as a complete sentence:

Each girl will get 36 sweets.

Example

Share 186 sweets equally amongst five girls.

Answer

Number sentence $186 \div 5 = \square$

$$\begin{aligned}
 &180 \div 5 \\
 &= (150 + 30 + 6) \div 5 \\
 &= (150 \div 5) + (30 \div 5) + (6 \div 5) \\
 &= 30 + 6 + 1 \text{ remainder } 1 \\
 &= 37 \text{ remainder } 1
 \end{aligned}$$

Check the answer:

$$\begin{aligned}
 37 \times 5 &= (30 \times 5) + (7 \times 5) \\
 &= 150 + 35 = 185
 \end{aligned}$$

Plus 1 remainder $185 + 1 = 186$

Answer as a complete sentence:

Each girl will get 37 sweets, and one sweet will be left over.

Example

Hazel has 108 koeksusters. How many bags of 12 koeksusters each can Hazel make up?

**Answer**

Number sentence $108 \div 12 = \square$

We can calculate this in different ways.

Break up the number being divided	Repeated subtraction	
$108 \div 12$ $= (60 + 48) \div 12$ $= (60 \div 12) + (48 \div 12)$ $= 5 + 4$ $= 9$	$108 - 60 - 48 = 0$ $4 + 5 = 9$	Clue board $12 \times 4 = 48$ $12 \times 5 = 60$

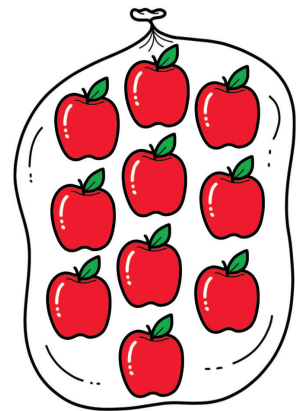
Check the answer $12 \times 9 = (10 \times 9) + (2 \times 9)$
 $= 90 + 18 = 108$

Answer as a complete sentence:

Hazel can make up 9 bags of 12 koeksusters each.

Example

A farmer picks 183 apples and he packed ten apples in a bag. How many bags of apples can the farmer pack?



Answer

Number sentence $183 \div 10 = \square$

$183 \div 10$
 $= (100 + 80 + 3) \div 10$
 $= 10 + 8 + \text{remainder } 3$
 $= 18 + \text{remainder } 3$



Answer as a complete sentence:

The farmer can pack 18 bags of apples and there will be 3 left over.

Example

Bongi sells cupcakes in a tray of 12. She has 114 cupcakes. How many trays of 12 cupcakes each can she make up?



Answer

Number sentence $114 \div 12 = \square$

We can calculate this in different ways.

Break down the number being divided	Repeated subtraction
$114 \div 12$ $= (60 + 48 + 6) \div 12$ $= (60 \div 12) + (48 \div 12) + (6 \div 12)$ $= 5 + 4 + 6 \text{ remainder}$ $= 9 + 6 \text{ remainder}$	$114 - 60 - 48 = 6$ $4 + 5 = 9$ Clue board $12 \times 4 = 48$ $12 \times 5 = 60$

Check the answer $(12 \times 9) = 108 + 6$

Answer as a complete sentence:

Bongi can make up 9 trays of 12 cupcakes each.

There will be 6 cupcakes left.

Activity 10

1. A bakery sells bread rolls in bags of 12. They have 98 rolls. How many bags of 12 rolls can they make?
2. Five friends share 94 sweets so that they all get the same number of sweets. How many sweets does each friend get?
3. A farmer has 230 eggs. How many egg boxes that can take 6 eggs each does he need to pack all the eggs?
4. You have 127 biscuits and you want to share them equally onto five plates.
 - a) How many biscuits will there be on each plate?
 - b) Check your answer using multiplication.
5. Create five of your own word problems that involve equal sharing and grouping up to 200, and are different from the ones you are used to seeing.

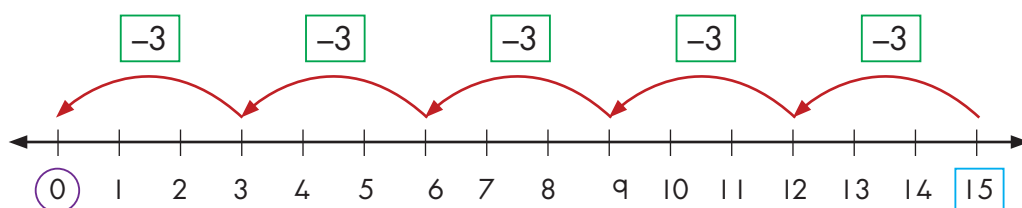
Division

In this unit you will divide numbers up to 99 by 1, 2, 3, 4, 5 and 10.

Division is the **inverse operation** of multiplication. Division is repeated subtraction and is related to grouping.

Example

Look at the numberline.

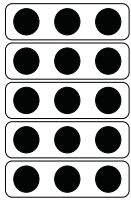


$15 \div 3 = 5$ is the number of times you can subtract 3 from 15 before you get 0.

$$15 - 3 - 3 - 3 - 3 - 3 = 0$$

$$15 \div 3 = 5$$

Look at the counters and the number sentences.

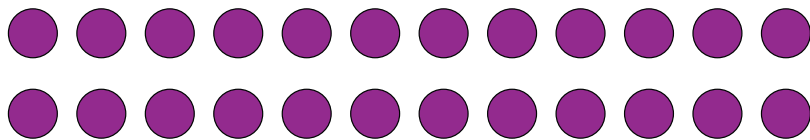


There are 5 groups of 3.

$$15 - 3 - 3 - 3 - 3 - 3 = 0$$

$$15 \div 3 = 5$$

6. Hazel has 24 counters. She makes two rows of 12 each.



Work with your friend and make up different rows that give a rectangular shape.

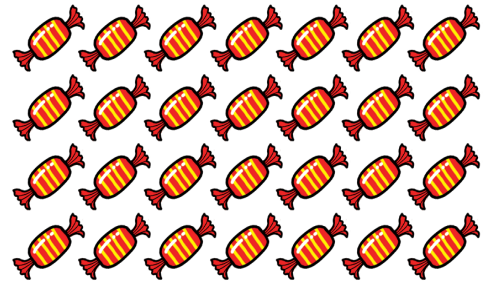
Record your findings as:

2 rows of 12	$24 \div 2 =$
3 rows of <input type="text"/>	$24 \div 3 =$
4 rows of <input type="text"/>	$24 \div 4 =$
<input type="text"/> rows of <input type="text"/>	$24 \div 6 =$
<input type="text"/> rows of <input type="text"/>	$24 \div 8 =$
<input type="text"/> rows of <input type="text"/>	$24 \div 12 =$

Example

28 people will get one sweet each.

14 people will get 2 sweets each.



a) Complete:

7 people will get sweets each

4 people will get sweets each

2 people will get sweets each

1 person will get sweets each

b) Use the groups you created to complete the division number sentences:

$28 \div 1 =$	$28 \div 28 =$
$28 \div 2 =$	$28 \div 14 =$
$28 \div 4 =$	$28 \div 7 =$

Example

You know: $24 \div 3 = 8$

a) What is $24 \div 8$?

b) What is 8×3 ?

c) What is 3×8 ?

Answer

a) $24 \div 8 = 3$

b) $8 \times 3 = 24$

c) $3 \times 8 = 24$

Example

You know: $24 \div 4 = 6$

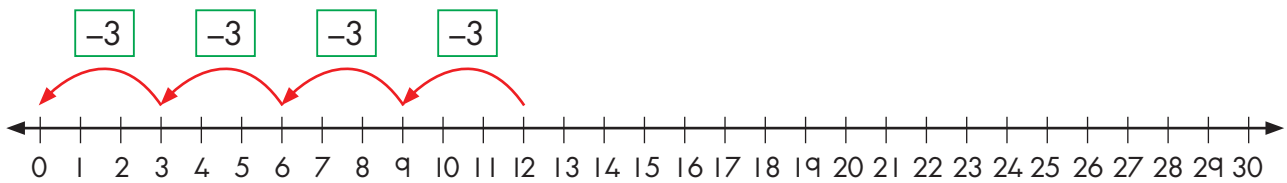
- a) What is $24 \div 6$?
- b) What is 6×4 ?
- c) What is 4×6 ?

Answer

- a) $24 \div 6 = 4$
- b) $6 \times 4 = 24$
- c) $4 \times 6 = 24$

Example

Start at 12. Count backwards in 3s on the numberline. Write the division fact.

**Answer**

$$12 \div 3 = 4$$

Example

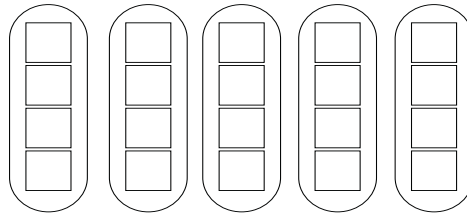
There are 12 months and 4 seasons in a year. If each season has an equal number of months, how many months are in each season?

Answer

$$12 \div 4 = 3$$

Example

Use the picture of grouped blocks to determine $20 \div 4$.



Answer

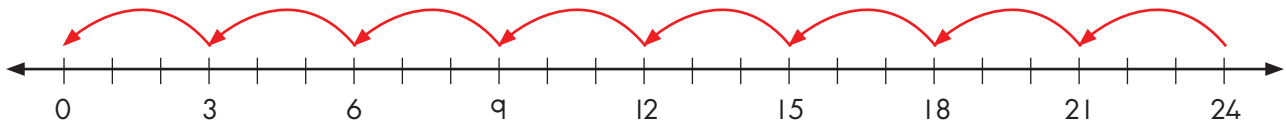
The 20 blocks are grouped in five groups of 4 blocks each.

$$20 - 4 - 4 - 4 - 4 - 4 = 0$$

$$20 \div 4 = 5$$

Example

Look at the number line.



Write two number sentences that link repeated subtraction to division.

Answer

$$24 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 - 3 = 0$$

$$24 \div 3 = 8$$

You can subtract 3 from 24
8 times before you reach 0.

Example

Maddy bakes 30 biscuits. She plans to put 5 biscuits on every plate. How many plates will Maddy need?

Answer

Method

Draw pictures.



Maddy will need 6 plates.

Use repeated subtraction

$$30 - 5 - 5 - 5 - 5 - 5 - 5 = 0$$

Maddy will need 6 plates.

You can subtract 5 from 30 6 times before you reach 0.

Use division

$$30 \div 5 = 6$$

Maddy will need 6 plates.

Rules for dividing by 1 and 0

Rules for dividing by 0

Zero divided by any number equals zero.

$$0 \div 9 = 0 \text{ and } \frac{0}{500} = 0$$

We cannot divide by 0.

Therefore, any number divided by 0 is not defined.

$80 \div 0$ is undefined

and $\frac{600}{0}$ is undefined

Take note

In Maths, undefined means that the number does not exist.

Rules for dividing by 1

Any number divided by itself equals 1.

$$20 \div 20 = 1 \text{ and } \frac{35}{35} = 1$$

Any number divided by 1 equals that number.

$$9 \div 1 = 9 \text{ and } \frac{60}{1} = 60$$

Example

Calculate

$$\frac{16 - 16}{2 \times 5}$$

Answer

$$\begin{aligned} & \frac{16 - 16}{2 \times 5} \\ &= \frac{0}{10} \\ &= 0 \end{aligned}$$

Example

Calculate

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

Answer

$$\begin{aligned} & \frac{6 \times 3}{5 - 5} \\ &= \frac{18}{0} \text{ undefined} \end{aligned}$$

Techniques on how to divide

We can break up a number into smaller parts that are easier to calculate. We can also use the multiplication facts we know in a clue board, to help us divide. You can also break down a number into halves.

Example

Solve the problem:
Divide 51 by 3.

Answer

Number sentence: $51 \div 3 = \square$

Method 1

Break down the number into parts

$$\begin{aligned} 51 \div 3 \\ &= (30 + 21) \div 3 \\ &= (30 \div 3) + (21 \div 3) \\ &= 10 + 7 \\ &= 17 \end{aligned}$$

Method 2

Use the multiplication clue board.

$$\begin{aligned} 51 \div 3 &= \square \\ 10 \times 3 &= 30 \\ 7 \times 3 &= 21 \\ 10 + 7 &= 17 \end{aligned}$$

Clue board

I know $10 \times 3 = 30$

I know $7 \times 3 = 21$

Therefore $51 \div 3 = 17$

Multiplication is the reverse operation of division.

Check

Use multiplication to check the answer: $17 \times 3 = 51$

Example

Solve the problem:
Divide 88 by 4.

Answer

Method 1

Break up the number into parts:

$$\begin{aligned}88 \div 4 \\&= (40 + 40 + 8) \div 4 \\&= (40 \div 4) + (40 \div 4) + (8 \div 4) \\&= 10 + 10 + 2 \\&= 22\end{aligned}$$

Method 3

Break up the number into halves:

$$88 \div 2 = 44$$

$$44 \div 2 = 22$$

$$\text{Therefore } 88 \div 4 = 22$$

Multiplication is the reverse operation of division.

Check

Use multiplication to check the answer: $22 \times 4 = 88$

Example

Solve the problem:

Fundiswa learns 5 spelling words every day. How many days does it take Fundiswa to learn 45 spelling words.

Answer

Number sentence: $45 \div 5 = \square$

Method 1

Break up the number into parts

$$\begin{aligned}45 \div 5 \\&= (30 + 15) \div 5 \\&= (30 \div 5) + (15 \div 5) \\&= 6 + 3 \\&= 9\end{aligned}$$

Method 2

$$45 \div 5 = 9$$

It will take Fundiswa 9 days to learn 45 spelling words.

Clue board
 $9 \times 5 = 45$

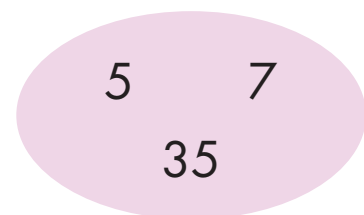
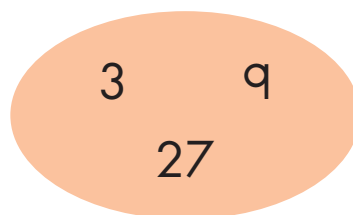
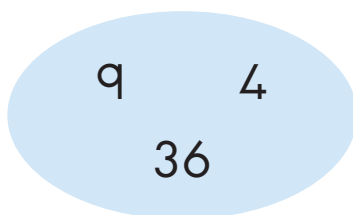
Multiplication is the reverse operation of division.

Check

Use multiplication to check the answer: $9 \times 5 = 45$

Example

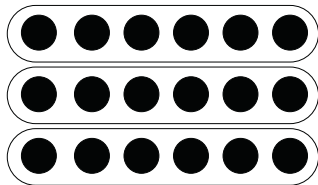
Use the fact family in each circle to make four number sentences.



Answer

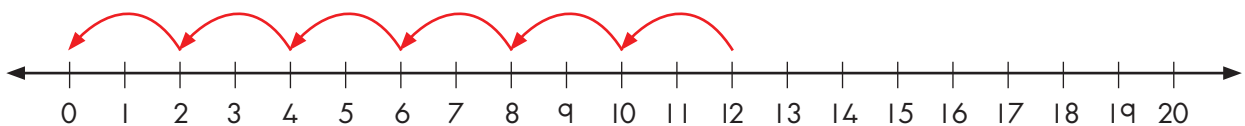
9 4 36	3 9 27	5 7 35
$9 \times 4 = 36$	$3 \times 9 = 27$	$5 \times 7 = 35$
$4 \times 9 = 36$	$9 \times 3 = 27$	$7 \times 5 = 35$
$36 \div 4 = 9$	$27 \div 9 = 3$	$35 \div 7 = 5$
$36 \div 9 = 4$	$27 \div 3 = 9$	$35 \div 5 = 7$

7. Look at the drawings and complete the sentence:



There are dots all together and there are groups of 6 dots each. Therefore \div 6 =

8. Start at 12. Count backwards in 2s on the number line.



- a) How many groups of 2s are in 12?
- b) Complete: $12 \div 2 =$
9. There are 30 desks in a classroom. There are 6 desks in each row. How many rows of desks are there?
- a) There are _____ desks.
- b) There are _____ desks in each row.
- c) There are _____ rows of desks.

10. You need to calculate $21 \div 3$.

- a) How many 3s are in 21?
- b) Draw a picture to represent this.
- c) Use repeated subtraction to calculate $21 \div 3$

11. Think about $8 \times \square = 32$.

Use this fact to solve the problem: $32 \div 8 = \square$

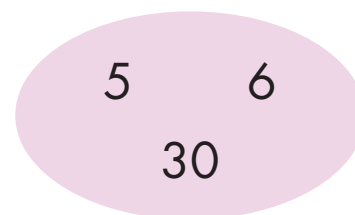
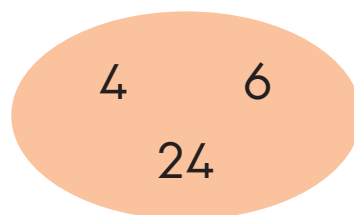
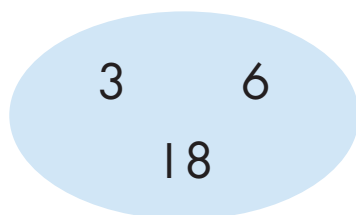
12. Fill in the missing numbers.

	Number	Half the number	Double the number
a)	600		
b)	50	25	
c)	28		56
d)			840
e)		150	
f)	500		

13. Start at 21. Count backwards in 3s. Write the division fact.

14. a) Divide 96 by 3.
- b) Divide 92 by 4.
- c) Divide 100 by 5.
- d) Share 64 amongst 4.
- e) How many fives make 60?
- f) How many fours are in 48?

15. Use the fact family in each circle to make four number sentences.



16. Chef Pixi divides flour into batches to make cakes. She has 18 cups of flour. Each cake takes 2 cups. How many cakes can she make?
17. Create five of your own different type word problems that involve division.
18. Group activity:
Design a poster about rules for dividing by 1 and 0. See the example below for ideas. Add as many examples as you can.

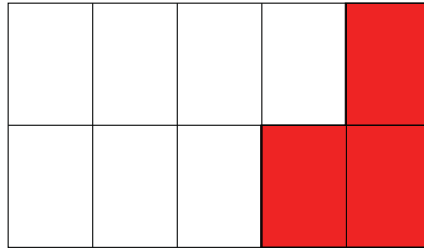
Rules for dividing by 1 and 0	Example
Rules for dividing by 0	
When 0 is divided by any number the answer is 0.	$\frac{0}{35} = 0$
Division by 0 is undefined.	$\frac{67}{0}$ is undefined
Rules for dividing by 1	
Any number divided by itself equals 1.	$\frac{55}{55} = 1$
Any number divided by 1 equals that number.	$\frac{75}{1} = 75$

Fractions

In this unit we will focus on fractions. A fraction is part of a whole.

Example

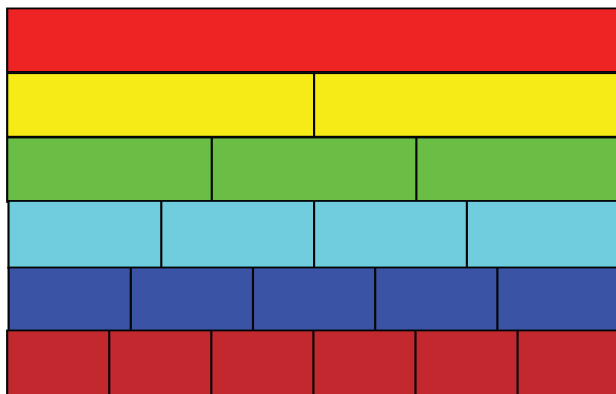
The rectangle is divided into 10 equal parts we call tenths. 3 tenths are shaded red and 7 tenths are not shaded.



Activity II

We can use a fraction wall to compare fractions.

- I. Look at the fraction wall or create your own fraction wall. Discuss with your friend how to use the fraction wall to answer the questions below.

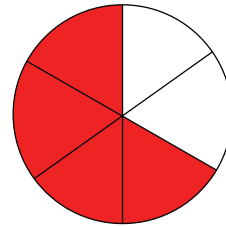


- a) Is 1 half bigger or smaller than 3 quarters?
- b) How many quarters are the same as 1 whole?
- c) Are two quarters equal to 1 half?
- d) How many sixths fit into one whole?

- e) How many sixths fit into one half?
- f) How many sixths fit into one third?
- g) How many thirds fit into one whole?
- h) How many sixths fit into two thirds?

Example

Write two different ways to name the shaded fraction.

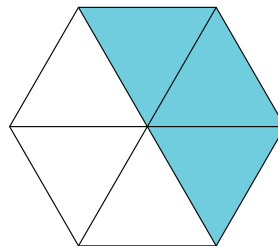


Answer

4 sixths
2 thirds

Example

Look at how the shape is divided into equal parts.



- a) In how many equal parts is the shape divided?
- b) How many sixths are the same as one whole?
- c) What fraction of the shape is shaded?
- d) How many sixths of the shape are shaded?

Answer

- a) Six equal parts
- b) Six sixths
- c) Half
- d) Three sixths

Example

There are 12 faces. Eight faces are happy, and four faces are sad.



- What fraction of the faces is sad?
- What fraction of the faces is happy?

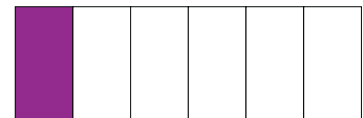
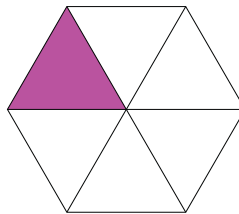
Answer

- One third
- Two thirds

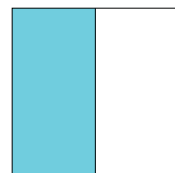
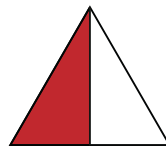
Activity 12

I. Complete.

E.g. When a shape is divided into six equal parts, we call these parts sixths.

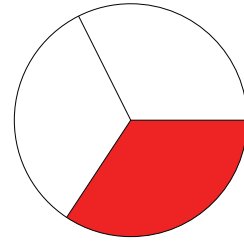
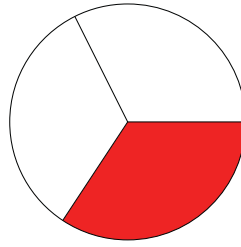


a) When a shape is divided into two equal parts, we call these parts _____.



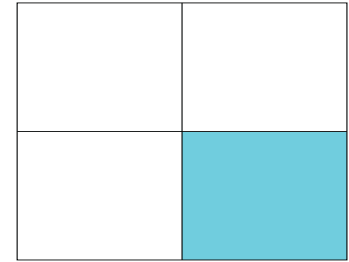
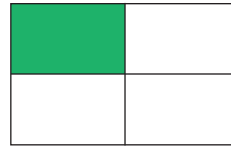
b)

When a shape is divided into three equal parts, we call these parts _____.



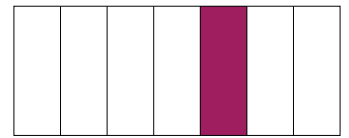
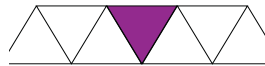
c)

When a shape is divided into _____ equal parts, we call these parts quarters.

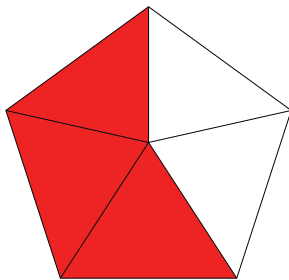


d)

When a shape is divided into seven equal parts, we call these parts _____.

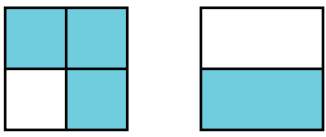
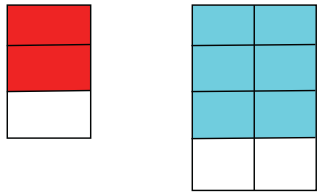
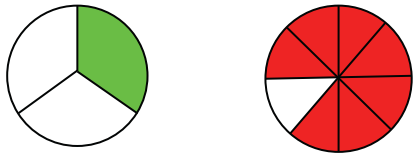
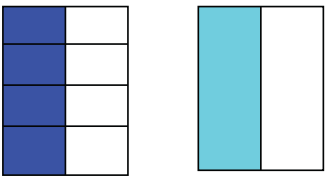
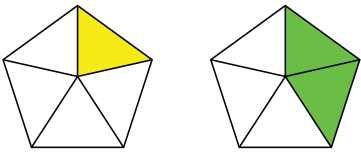
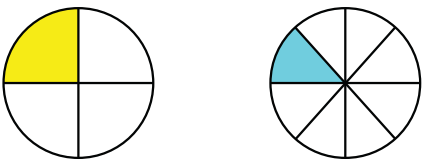


2. Look at how the shape was divided into equal parts.

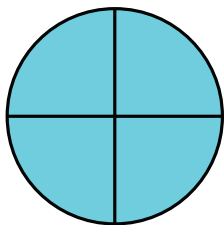


- a) In how many equal parts was the shape divided?
- b) What fraction of the shape is shaded?

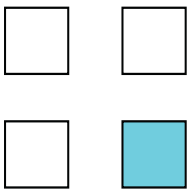
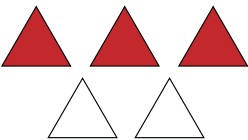
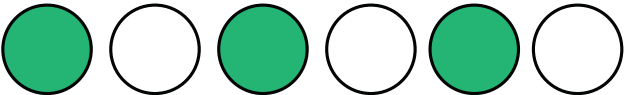
3. Compare the shaded fractions. Do not draw the shapes. Write only $>$; $<$ or $=$.

<p>E.g.</p>  <p>A $>$ B</p>	<p>E.g.</p>  <p>A $=$ B</p>	<p>E.g.</p>  <p>A $<$ B</p>
<p>a)</p>  <p>A B</p>	<p>b)</p>  <p>A B</p>	<p>c)</p>  <p>A B</p>


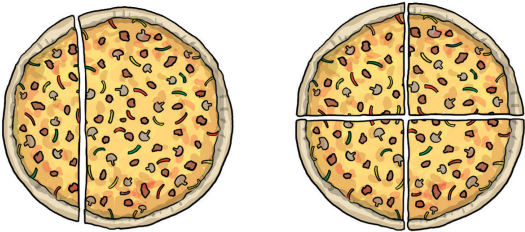






4. Write two different ways to name the shaded fraction.



5. What fraction of each set is shaded?

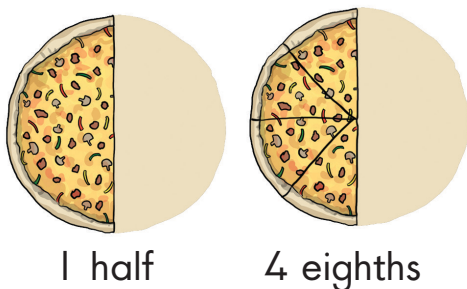
<p>a)</p> 	<p>b)</p> 	<p>c)</p> 
-----------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------

Sharing leading to fractions

 Whole	Must have equal parts  Unequal Equal
 Half	 Sixth
 Third	 Seventh
 Fourth	 Eighth

Activity 14

- Work with your friend to solve this problem:



Karabo complains that it is unfair because he gets one slice of pizza while Kenny gets four slices of pizza.

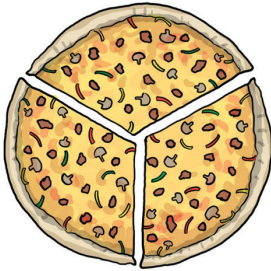
Explain to Karabo why it is not unfair. Two pizzas are cut into fractions as shown.

Example

Explain how you will share one pizza equally among three people.

Answer

If we cut the pizza into three equal parts, we share it fairly.



Each person will get a third of the pizza.

Example

If the rectangle below represents a cake, what fraction of the cake is shaded?

**Answer**

One quarter of the cake is shaded.

Jama, Jill and Joe are sharing five cakes equally.

How much will each person get?



Example

Show how four friends can share 6 biscuits equally.

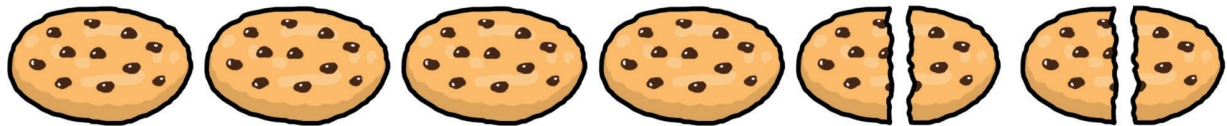


Answer

Give one biscuit to each friend.



Share the remainder of the biscuits by cutting them in half.

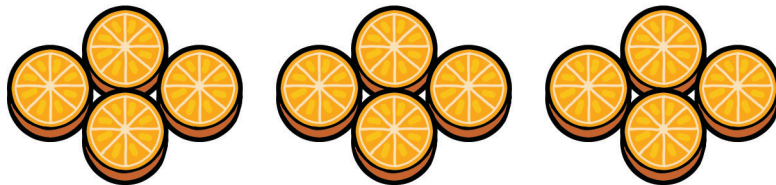


Each person will get one full biscuit and a half biscuit.



Example

The soccer coach gives half an orange to each player.
There are 12 players. How many oranges does he need?




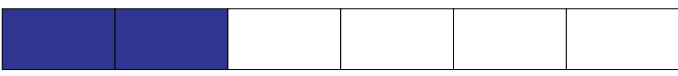




Answer



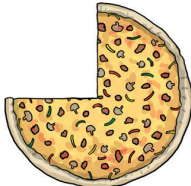
There are two halves in one orange.
The soccer coach needs six oranges.

Activity 15

1. Complete the table. Do not draw the fraction strip.

	Fraction strip	Fraction shaded
E.g.		4 tenths
a)		
b)		
c)		
d)		
e)		

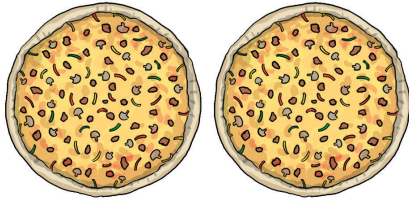
2. Look at the pizza.

		
Magosi's pizza	Mandla's pizza	Mina's pizza

Complete the sentences:

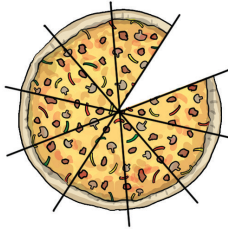
- Magosi's slice is about _____ of a pizza.
- Mandla's slice is about _____ of a pizza.
- Mina ate about _____ of her pizza.

3. Four friends share two pizzas equally.



- a) What are two ways the pizza could be divided equally?
Use pictures to explain your answer.
- b) How much pizza will each friend get?

4. Look at the pizza that was cut up into slices.

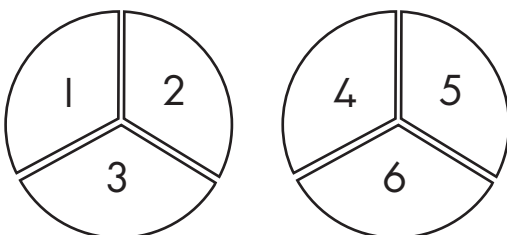


- a) One slice of pizza was eaten. What fraction of the pizza was eaten?
- b) Thandi stated: "One half of the pizza is equal to five ninths."

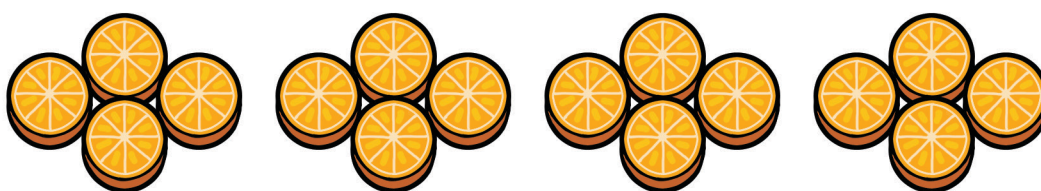
Explain why you do not agree with Thandi.

5. Six friends want to share two pizzas, so that each friend gets the same share of each pizza.

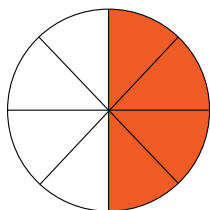
Modjadji drew two circles to represent the pizzas. She cut each pizza into 3 pieces and numbered each piece. Each friend got one third of a pizza.



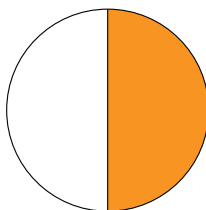
- a) Has she shared the pizza correctly? If not, what is wrong with Modjadji's reasoning?
- b) Use pictures to show how you can divide the two pizzas so that each friend gets an equal share of each pizza.
- c) How much of each pizza will each friend get if you share it equally?
6. The netball coach gives half an orange to each player. There are 16 players. How many oranges does she need?



7. Look at the shaded circles.



A



B

Complete:

- a) In Circle A four _____ are shaded.
- b) In Circle B one _____ is shaded.
- c) Thando stated that the shaded part of Circle A is bigger than the shaded part of Circle B. Do you agree with Thando? Explain with reasons.
8. a) Charlotte eats 2 pieces of the chocolate shown:



What fraction of the chocolate did Charlotte eat?

- b) Charlie eats a quarter of the chocolate shown.



How many pieces did Charlie eat?

9. Jama, Jill and Joe are sharing seven cakes equally. How much will each person get?

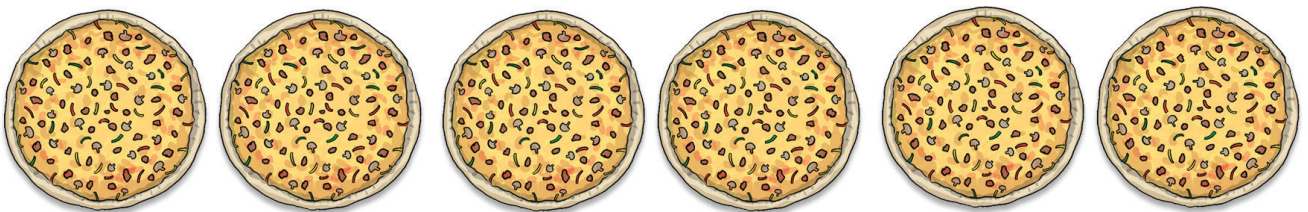


10. Share seven chocolate bars among three friends so that they all get the same number of chocolate pieces and there is nothing remaining.



11. Share 15 chocolate bars among 6 friends so that they all get the same number of chocolate pieces and there is nothing remaining.

12. Share 6 pizzas equally amongst 10 friends.



Money

It is important to solve money problems accurately and quickly. Study the different coins and notes we use in South Africa.

						
10 cents	20 cents	50 cents	1 rand	2 rand	5 rand	10 rand
						
20 rand	50 rand	100 rand	200 rand			

Activity 16

- Work with a friend and write down the different ways you can make up R400 using only bank notes.

Example

Write 625c as rands and cents.

Answer

$$625c = R6,25$$

Example

Mandla has two R2 coins and four 50c coins. He bought a chocolate for R5,90. How much change will Mandla get?



Answer

Mandla has $R4 + R2 = R6$

Change:

$$R6,00 - R5,90 = 10c$$

Example

Thabang bought three books for R90 each.
How much change will he get from R300?



Answer

Total of the three books:

$$R90 + R90 + R90 = R270$$

Change:

$$R300 - R270 = R30$$

Example

A packet of 5 peaches cost R10 each. A chef needs 28 peaches.

- How many packets of peaches should the chef buy?
- What will the chef pay for the peaches?







Answer

- The chef should buy 6 packets of peaches.
- $6 \times R10 = R60$

The chef will pay R60 for the peaches.

2. What is the value of each set of bank notes and coins?

<p>a)</p> 	<p>b)</p> 
<p>c)</p> 	<p>d)</p> 

3. Vusi bought three fast food meals for R80 each. How much change will he get from R250?




4. A packet of five mealies costs R22.



Nomvuzo needs 17 mealies for a function.

- How many packets of mealies should Nomvuzo buy?
- How much will Nomvuzo pay for the mealies?

5. Look at the menu for Cyril's Canteen.

Cyril's Canteen		
Hamburger		R18,00
Milkshake		R8,00
Ice cream		R6,50

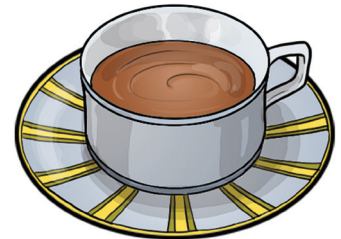
- a) Naledi buys two ice-creams and pays with a R50,00 note. How much change will she get?
- b) Thembi buys a hamburger and a milkshake and pays with a R100,00 note. How much change will he get?
- c) Sihle ordered two hotdogs and two milkshakes. Calculate the total amount for the four items.
- d) Max has two twenty-rand notes. How many milkshakes can he buy if he wants to spend all his money on milkshakes?
- e) Terrence has R15. Which two items can he buy?

Learn about patterns

Patterns with objects and shapes

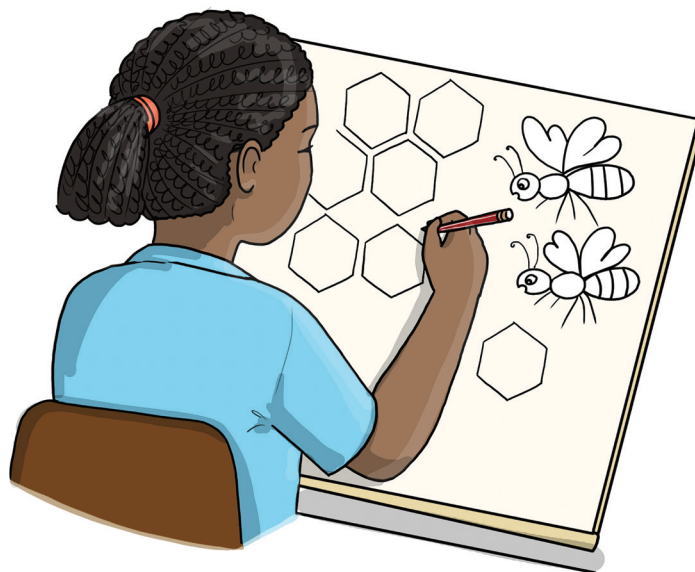
Activity 17

1. Cathy's mother has given Lerato a cup of tea. After Lerato had tea, she looked at the saucer and said the saucer is so beautiful.



Copy the pattern from the saucer.

2. Zondi uses triangles to make a picture of a honey comb. Try to copy Zondi's pattern in your book and see if you can succeed.



3. Venda speaking ladies wear dresses with patterns such as the one you see here. Choose one of the patterns on the dress and copy it.



4. Copy and complete the following patterns.

a) 25; 50; 75; ; ; ; ;

b) ; ; 875; 850; 825; ;

c) ; ; ; 940; 920; 900.

d) ; 650; 700; 750; ; ;

e) 880; 885; 890; ; ; ; ; 915

5. Copy and complete the following tables.

a)

Number of people	300	301	302	303	304	305
Number of eyes ($\times 2$)	600					

b)

Number of Classrooms	1	2	3	4	5	10	20
Number of people ($\times 25$)	25	50					

c)

Number of boxes	11	12	13	14	15	20	30
Number of chocolates ($\times 5$)	55	60	65				

d)

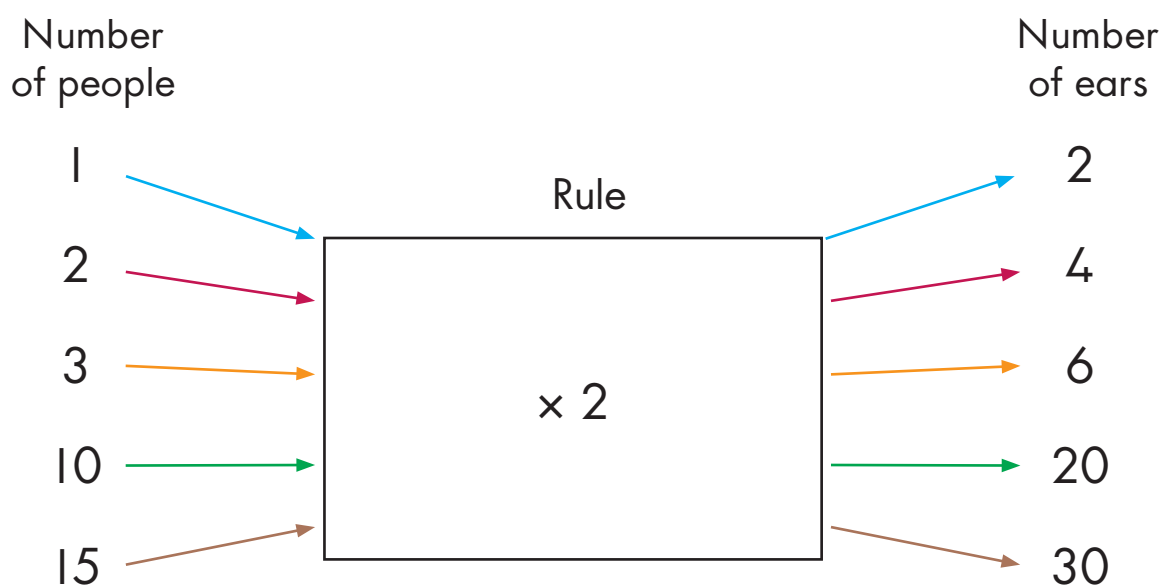
Number of boxes	11	12	13	14	15	20	30
Number of books ($\times 50$)	550	600					

Example

In a table such as this:

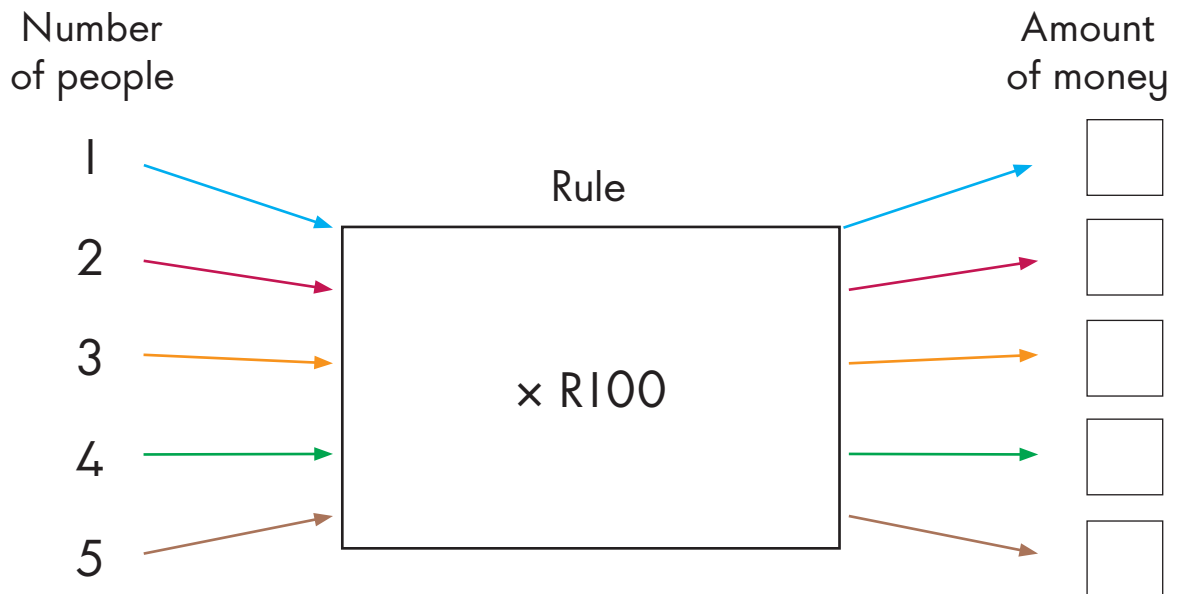
Number of people	1	2	3	10	15
Number of ears	2	4	6		

- we say that the number of ears is two times as many as the number of people. To find the number of ears, we must multiply the number of people by two.
- the number of ears = the number of people $\times 2$
- the flow diagram to represent the table will be:

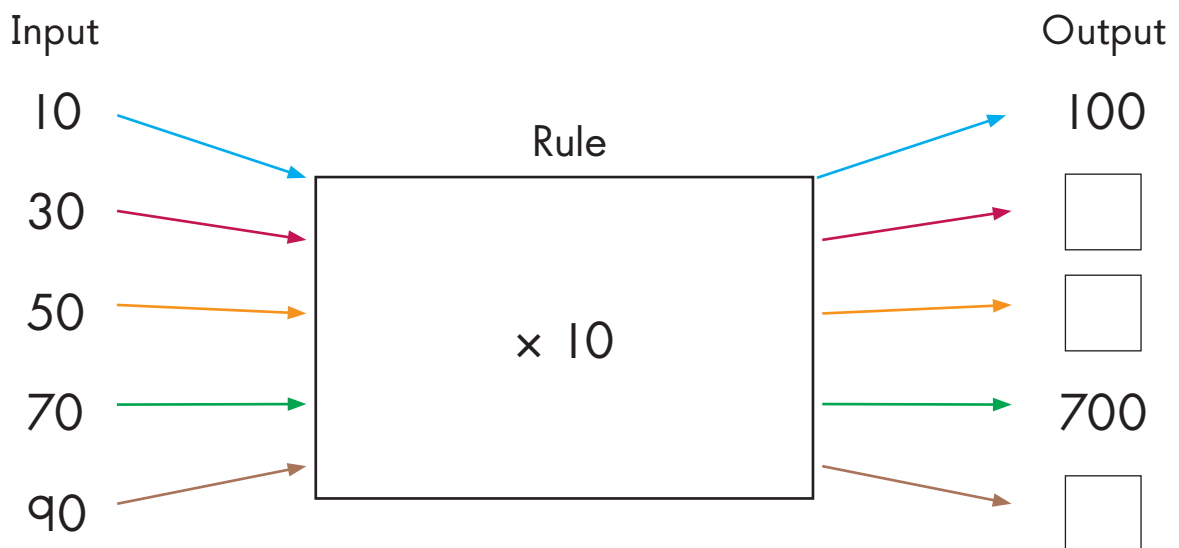


Both the table and the flow diagram represent the number of ears of a number of people.

6. a) Copy and fill in the missing numbers.



b) Copy and fill in the missing number



7. Draw a flow diagram of the following tables.

a)

Number of classrooms	1	2	3	5	10
Number of learners ($\times 25$)	25	50	75	100	125

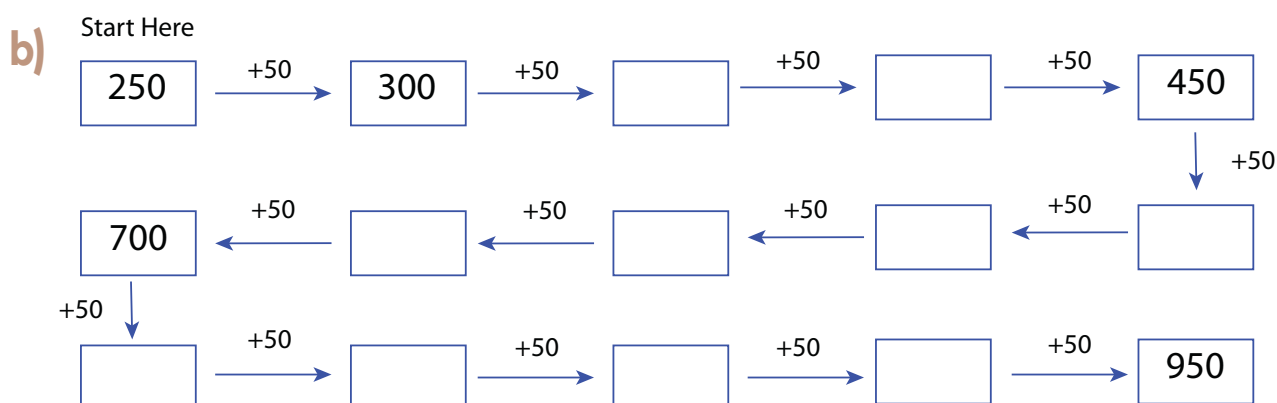
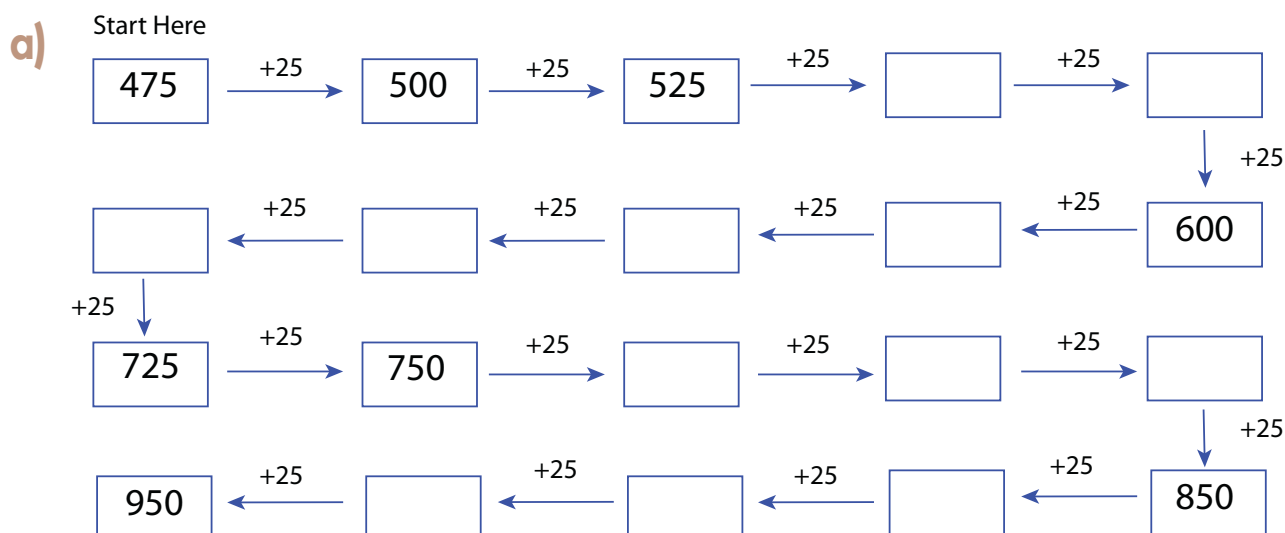
b)

Number of cars	1	2	3	5	10
Number of wheels ($\times 4$)	4	8	12	16	20

c)

Number of bicycles	1	2	3	10	20
Number of wheels ($\times 2$)	2	4	6	8	10

8. Copy and fill in the missing parts.



Time

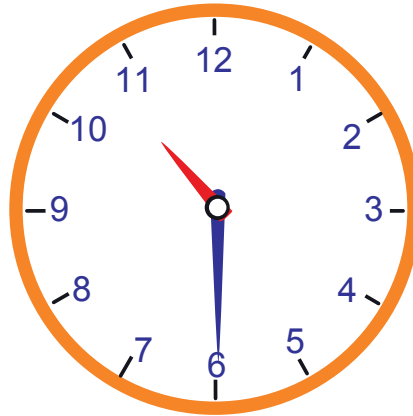
Activity 18

I. What is the time on the analogue clock?

a)



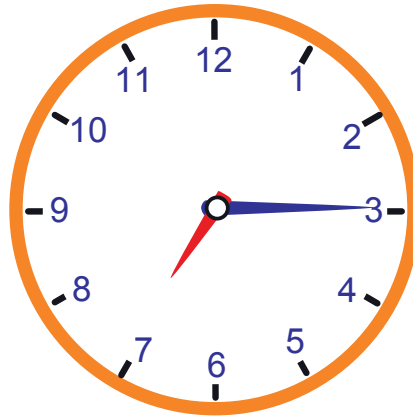
b)



c)



d)



e)



f)



2. Show the given digital times on an analogue clock:

a) 11:40

b) 09:45

c) 02:58

d) 07:15

e) 12:38

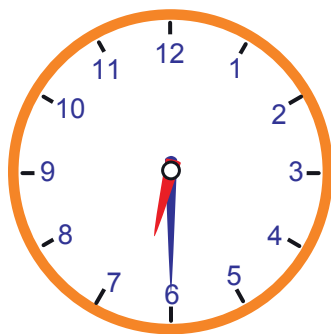
f) 05:05

Example

I woke up at half past 6 in the morning and had breakfast at 7 o'clock. How much time passed between when I woke up and when I had breakfast?

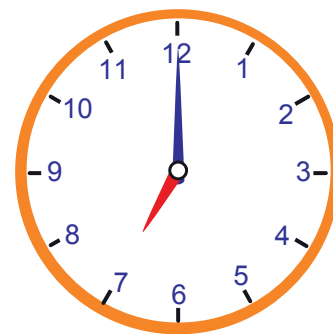
Answer

Waking up time



How much time?

Breakfast time



There were 30 minutes between the time when I woke up, and the time when I had breakfast.

Example

I left home at half past 10 in the morning to visit my friend. I got back home at quarter past 11.

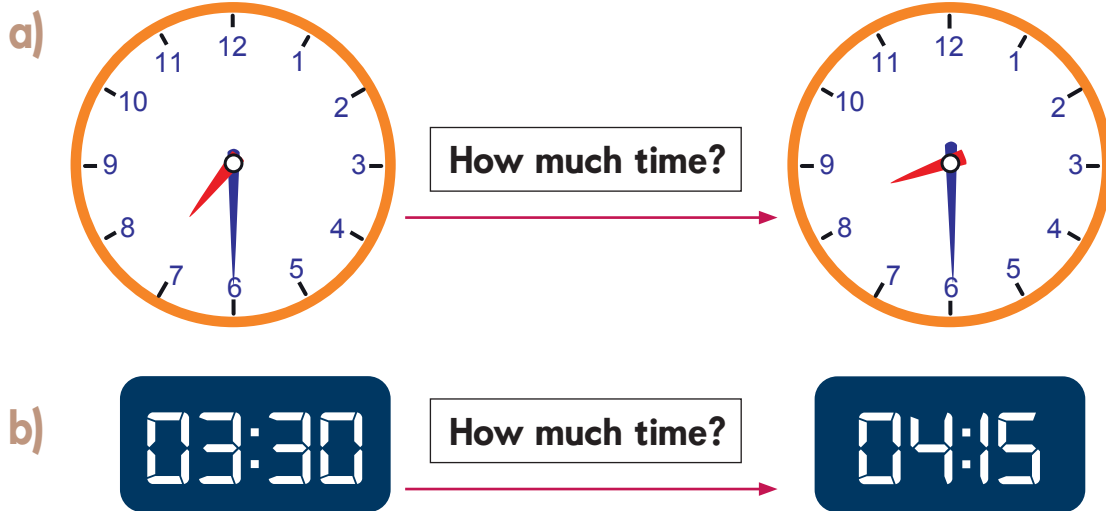
How much time passed while I was out?



How much time?



3. Look at the clocks below. What is the difference in time?



4. How much time passes between 3 o'clock in the afternoon and quarter to 4 in the afternoon?
5. How much time passes between quarter to 12 and 12 o'clock?
6. Our mathematics class started at 10 o'clock and finished at half past 11.
- a) Show both times on an analogue and a digital clock.
- b) How long was the mathematics class?
7. My friend Kwena and I left school at 13:30. I arrived home at 13:45, Kwena arrived at his home at 13:55. Who lives the furthest from the school? Explain.
8. It took me 55 minutes to walk home from school. I left school at 2 o'clock. What time did I reach home?
9. Wynand started reading a book at 11 o'clock in the morning. He finished reading 3 hours later. At what time did Wynand finish his book?

10. What was the time:
- a) half an hour before 1 o'clock?
 - b) quarter of an hour before 6 o'clock?
 - c) quarter of an hour after 12 o'clock?
11. My cousin's birthday is exactly 3 weeks from now. How many days until my cousin's birthday?
12. The last school holiday we had was 42 days ago. How many weeks have passed since we had a school holiday?
13. My uncle says he will buy me a bicycle in 6 months' time. I have started counting down from today. How many days must I count until the day I get my bicycle?

Hint: 3 months have 30 days and 3 months have 31 days

Area

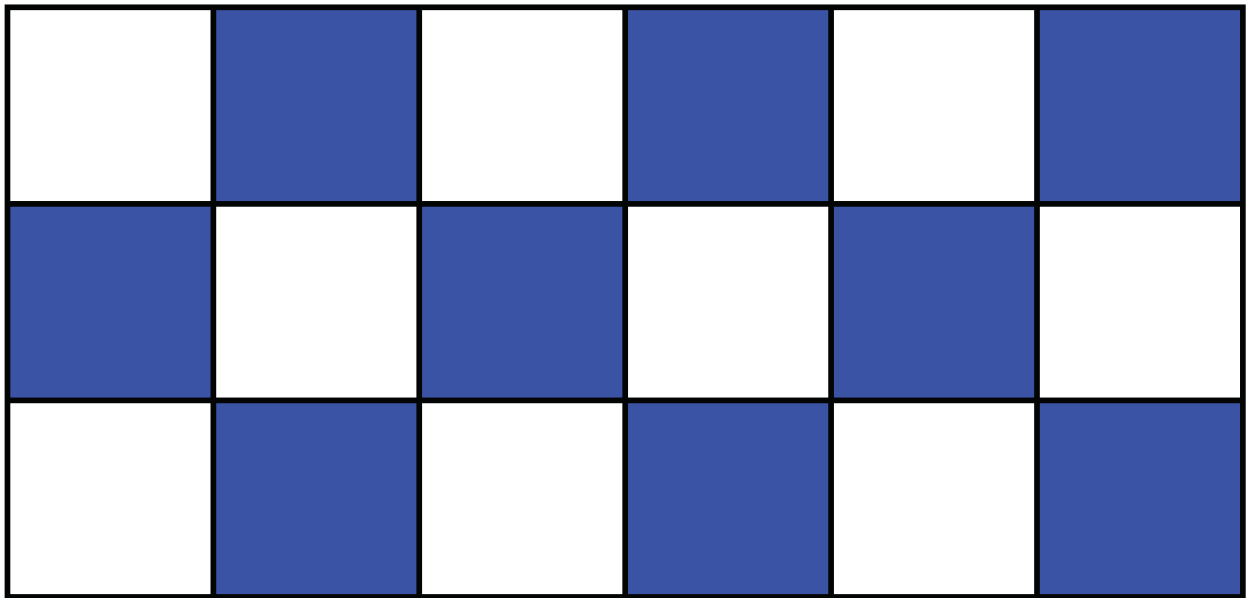
These are tiles. We use tiles to cover surfaces.



Example

To cover the surface below we need 18 tiles.

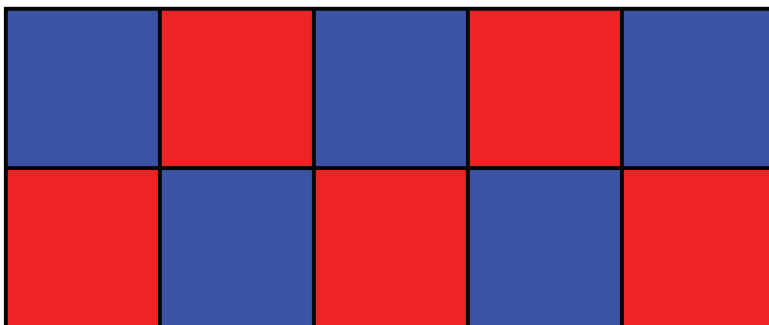
Another way of saying we need 18 tiles to cover the surface, is to say that the area of the surface is 18 tiles.



Activity 19

1. What is the area of these shapes? Give your answer in tiles.

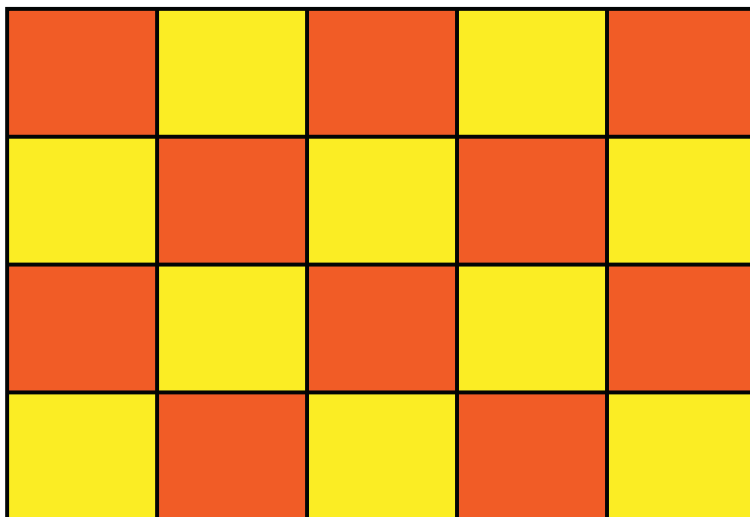
a)



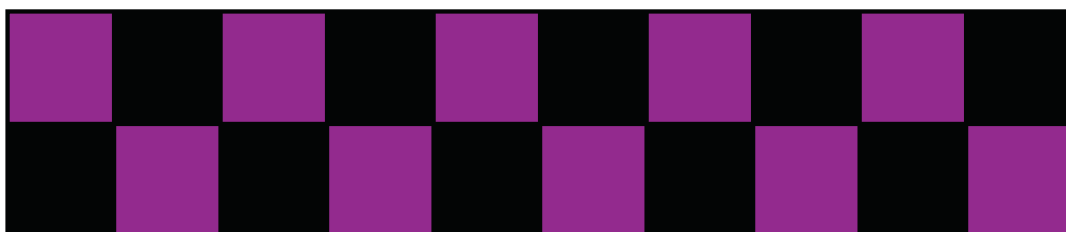
b)



c)

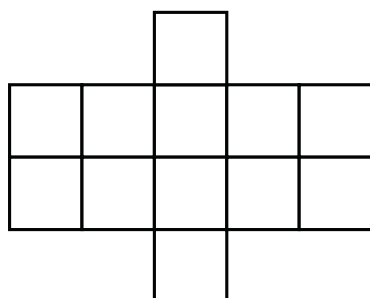


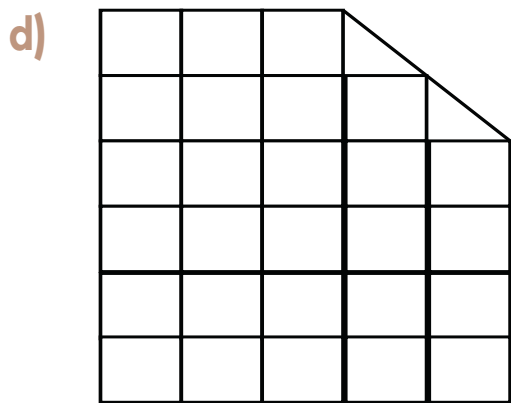
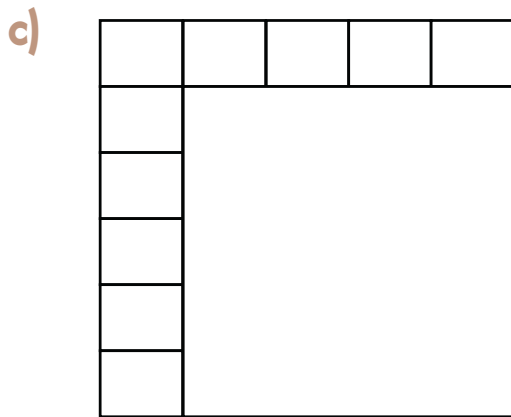
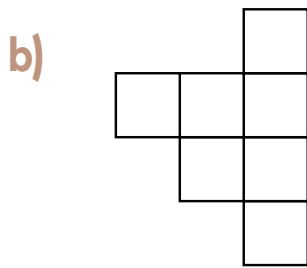
d)



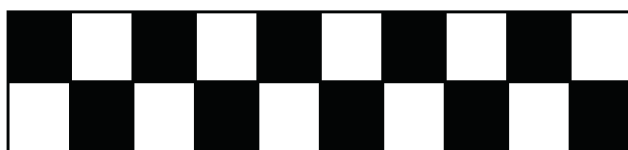
2. What is the area of these shapes? Give your answer in blocks.

a)

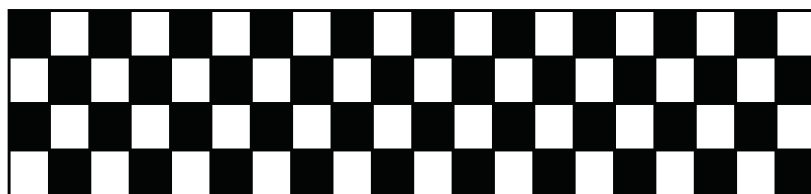




3. How many tiles cover the surface?



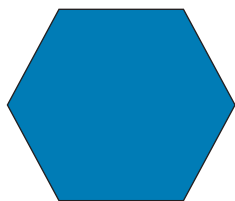
Surface A



Surface B

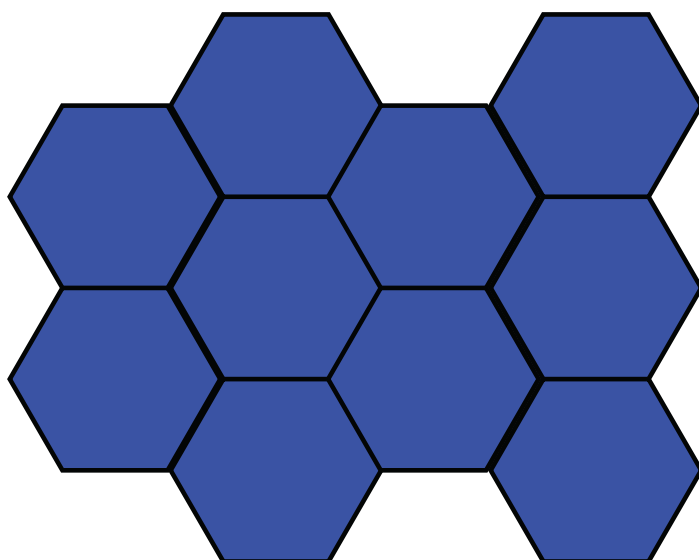
- a) What is the area of surface A?
- b) What is the area of surface B?
- c) Why do we have more tiles on surface B than on surface A?

5. This is a hexagon.

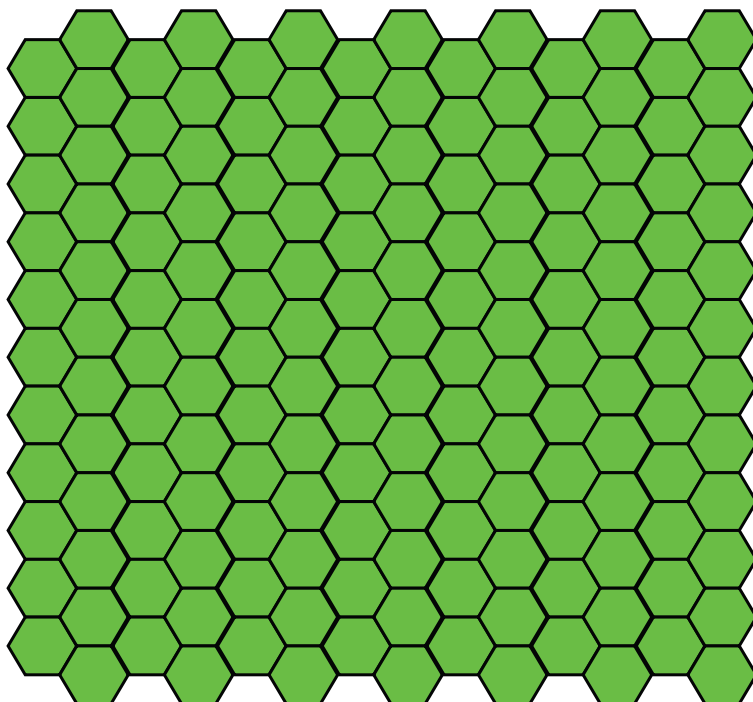


We can use tiles in the shape of a hexagon to cover space.
How many hexagons are covering each space below?

a)

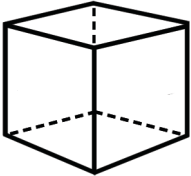
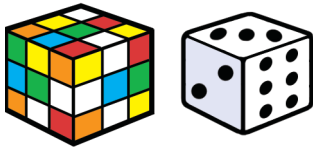
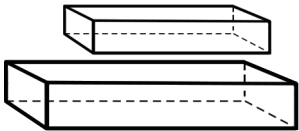
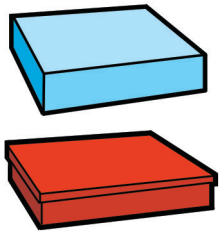

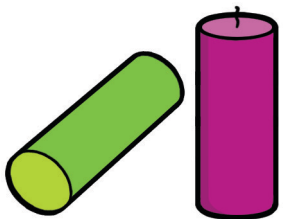
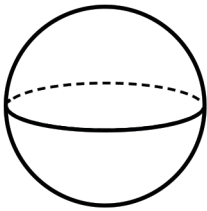



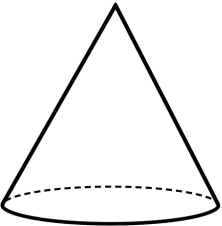
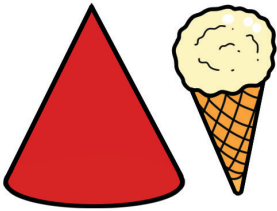
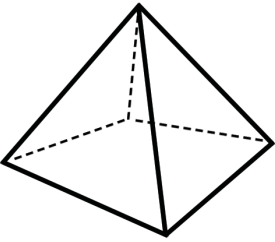
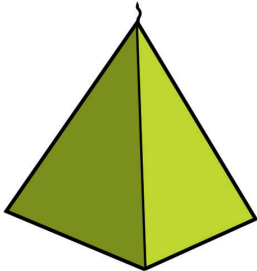
b)



Three-dimensional objects

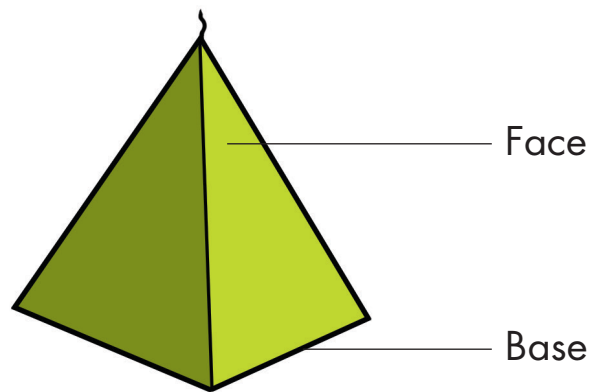
Three-dimensional objects take up space and they have three dimensions: length, width and height. The face is the flat surface of the 3-D object. 2-D shapes make up the faces of 3-D objects. Study the three-dimensional objects.

Three-dimensional objects	Flat or curved surface	Shapes of faces	Examples
Prism (box) 	Flat	Squares	
Rectangular prism (box) 	Flat	Rectangles	
Cylinder 	Curved	Circles and a rectangle	
Sphere 	Curved	None	

Cone 	Circular Flat	Circle	
Pyramid 	Flat	Square and triangular	

Example

Look at the pyramid.



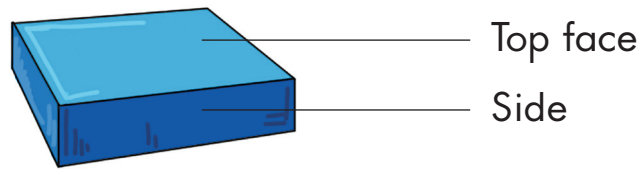
- What shape is the front face of the pyramid?
- What shape is the base of the pyramid?
- Will the pyramid roll or slide on the floor?

Answer

- A triangle
- Square
- It will slide on the floor.

Example

Look at the prism (box).



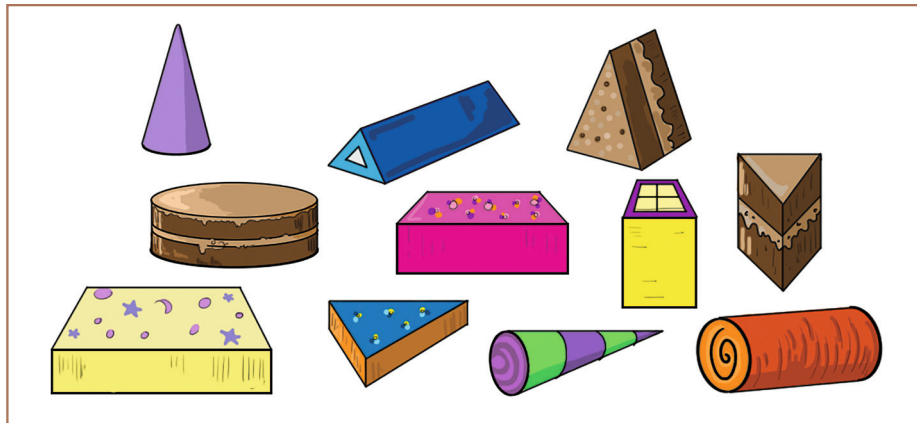
- a) What shape is the top face of the box?
- b) What is the shape of the side?
- c) Will the box roll or slide on the floor?

Answer

- a) A rectangle
- b) Rectangle
- c) It will slide on the floor.

Example

Look at the shapes.



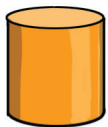
- a) How many cones are there?
- b) How many cylinders are there?

Answer

- a) Two cones
- b) Two cylinders

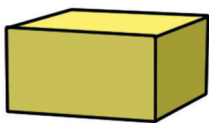
Activity 20

1. Look at the cylinder.



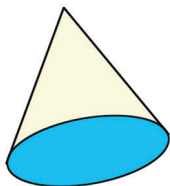
What shape is the top and bottom faces of the cylinder?

2. Look at this prism (box).



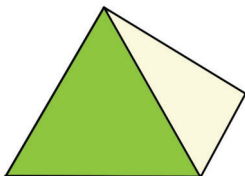
- a) What shape is the front face of this prism?
- b) Is the surface flat or curved?

3. Look at the cone.



- a) What shape is the blue shaded face?
- b) Is the surface flat or curved?






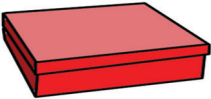

4. Look at the pyramid.



- a) What shape is the green shaded face?
- b) Are the surfaces flat or curved?

5. Sihle says that a three-dimensional object has three faces. Two faces are flat, and one face is curved. It has two circular sides. Which object is Sihle talking about?

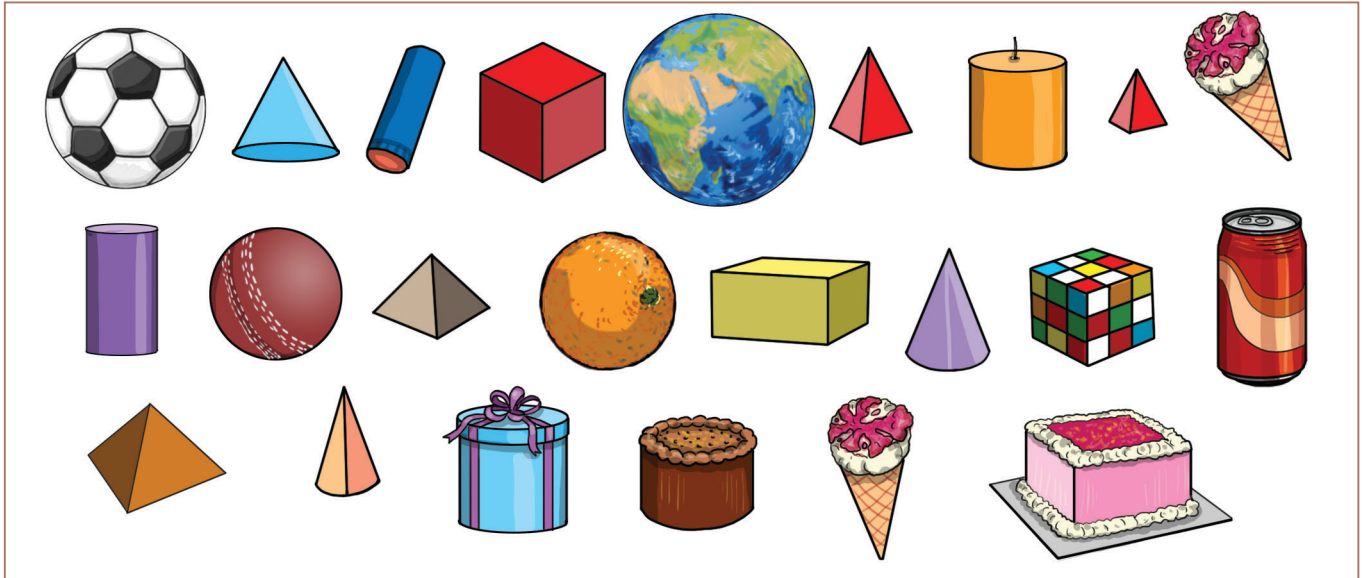
Complete the table. Do not draw the object.

	Object	Name the three-dimensional object	Flat or curved surfaces?	Two-dimensional shapes of the faces
E.g.		Prism	Flat	Square
a)				
b)				
c)				
d)				
e)				
f)				

6. Look at the picture. Identify the three-dimensional objects.


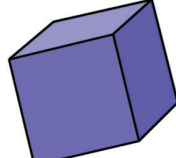
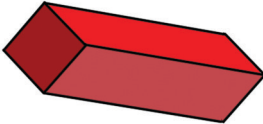


7. Look at the objects in the frame.



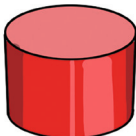
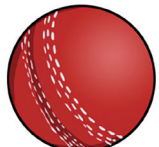



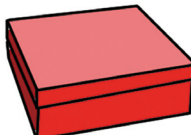
- How many cones in the frame?
- How many pyramids in the frame?
- How many boxes in the frame?
- How many rectangular prisms in the frame?
- How many spheres in the frame?
- How many of the objects in the frame have only flat surfaces?
- How many of the objects have only curved surfaces?
- How many objects have both flat and curved surfaces?

8. Complete the table.

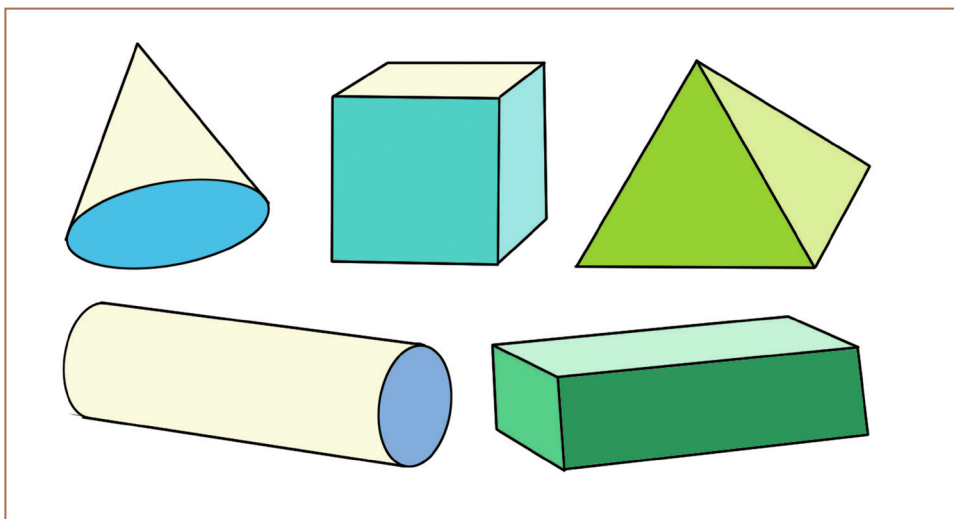
			
Name of the three-dimensional object			
Flat or curved surfaces			

9. Copy and complete the table. Tick ✓ if true and cross ✗ if not.

Do not draw the object.

Three-dimensional object		Flat surface	Curved surface
E.g. Cylinder		✓	✓
a) Sphere			
b) Cone			
c) Prism/box			
d) Pyramid			
e) Prism (box)			

10. Look at the objects in the frame.



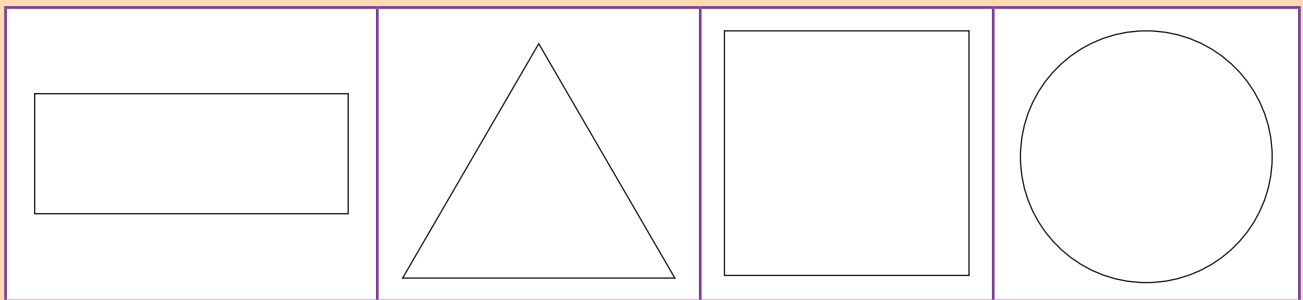
- a) Which object has the least number of flat faces?
- b) Which object has the most number of flat faces?
- c) Which objects roll?
- d) Which objects slide?
- e) What shape is the shaded face of the cone?

Symmetry

A shape has symmetry if a line can be drawn on the shapes which divides the shape into two halves. The two halves must match.

Take note

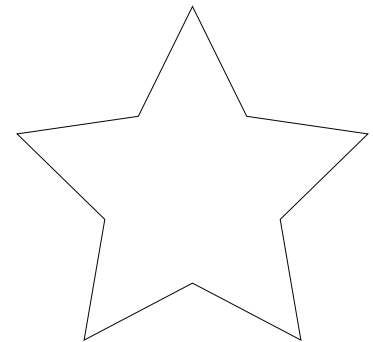
You can use the paper-folding method to investigate the lines of symmetry of two-dimensional shapes. Use paper and fold it to find out if the shape has one or more lines of symmetry.



We use a dotted line to show the line of symmetry because it is an imaginary line.

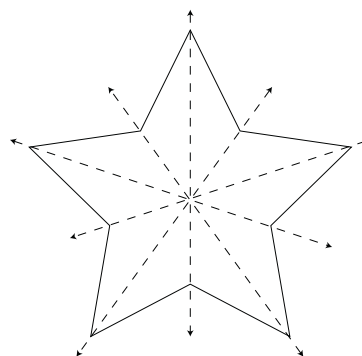
Example

How many lines of symmetry are there in this shape?



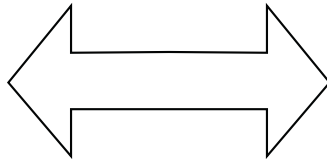
Answer

Five lines of symmetry.

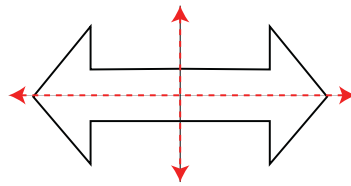


Example

Does this shape have one or more lines of symmetry?

**Answer**

This shape has two lines of symmetry.

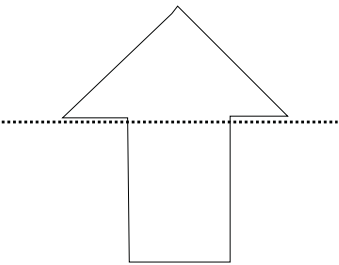
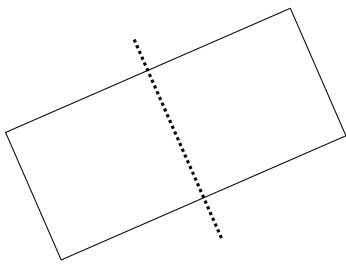
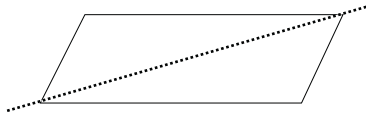

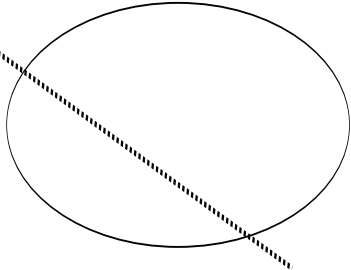
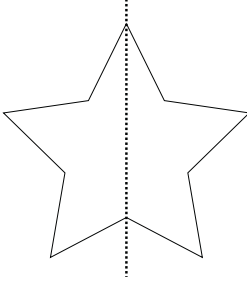
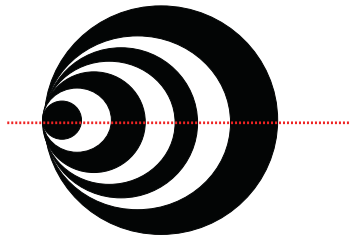
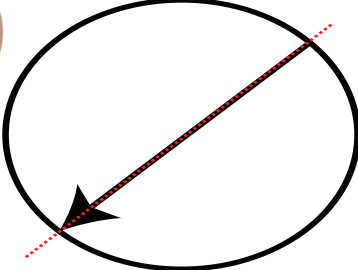
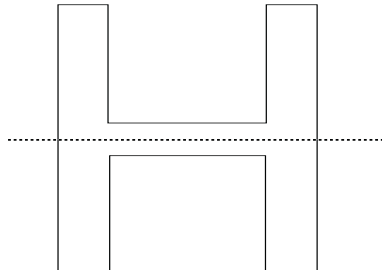
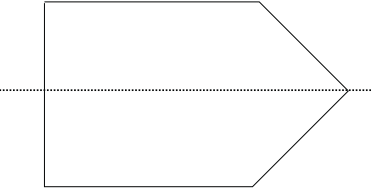
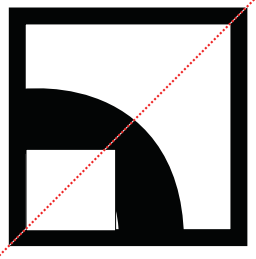
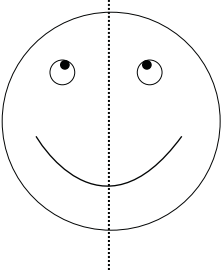
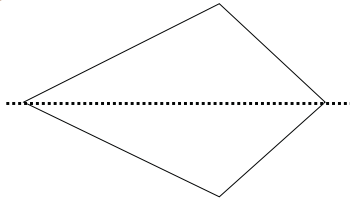
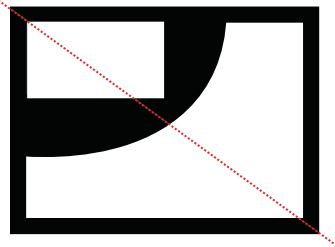
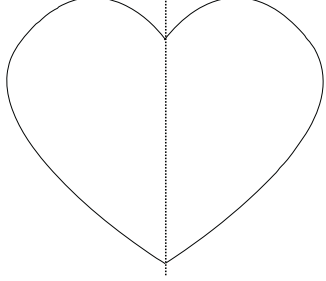
**Activity 21**

1. Look at the capital letters of the English alphabet.



- List the letters with no line of symmetry.
- List the letters with one line of symmetry.
- List the letters with more than one line of symmetry.

2. State if the dotted line on each shape is a line of symmetry or not.

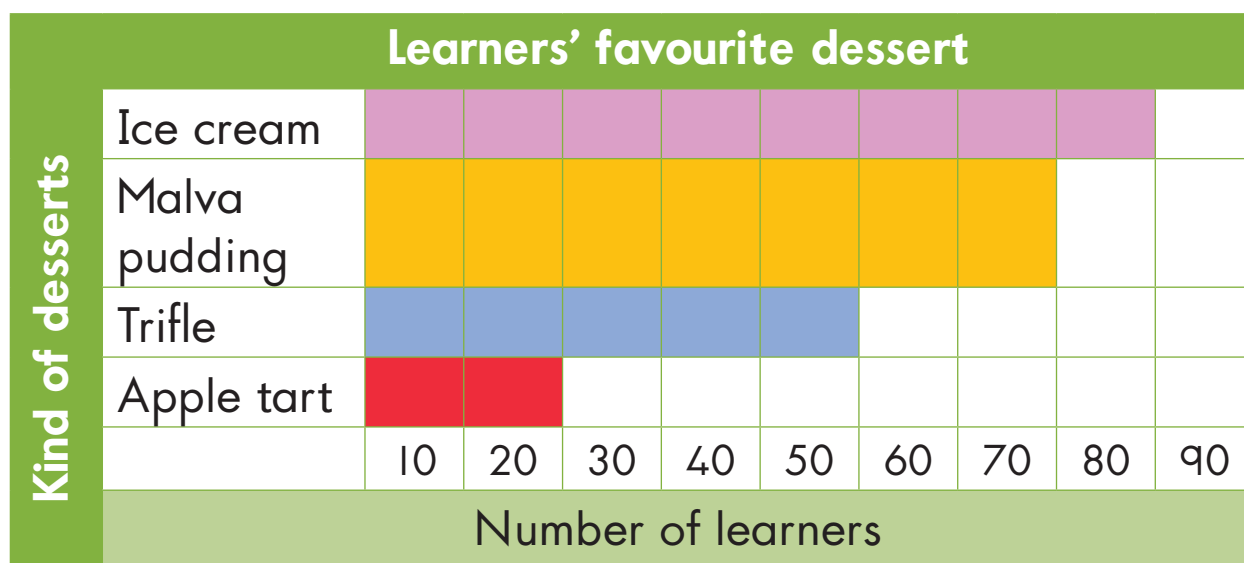
<p>a)</p> 	<p>b)</p> 	<p>c)</p> 
<p>d)</p> 	<p>e)</p> 	<p>f)</p> 
<p>g)</p> 	<p>h)</p> 	<p>i)</p> 
<p>j)</p> 	<p>k)</p> 	<p>l)</p> 
<p>m)</p> 	<p>n)</p> 	<p>o)</p> 

Analysing data

After we organise the data we collected, we can then visually display it in a pictograph or a bar graph. We can analyse the data to answer questions and draw conclusions.

Example

This bar graph shows the most popular desserts amongst the learners in Grade 3.



- What is the learners' favourite kind of dessert?
- What is the difference between the number of learners who prefer trifle to apple tart?
- How many learners chose malva pudding and ice cream?

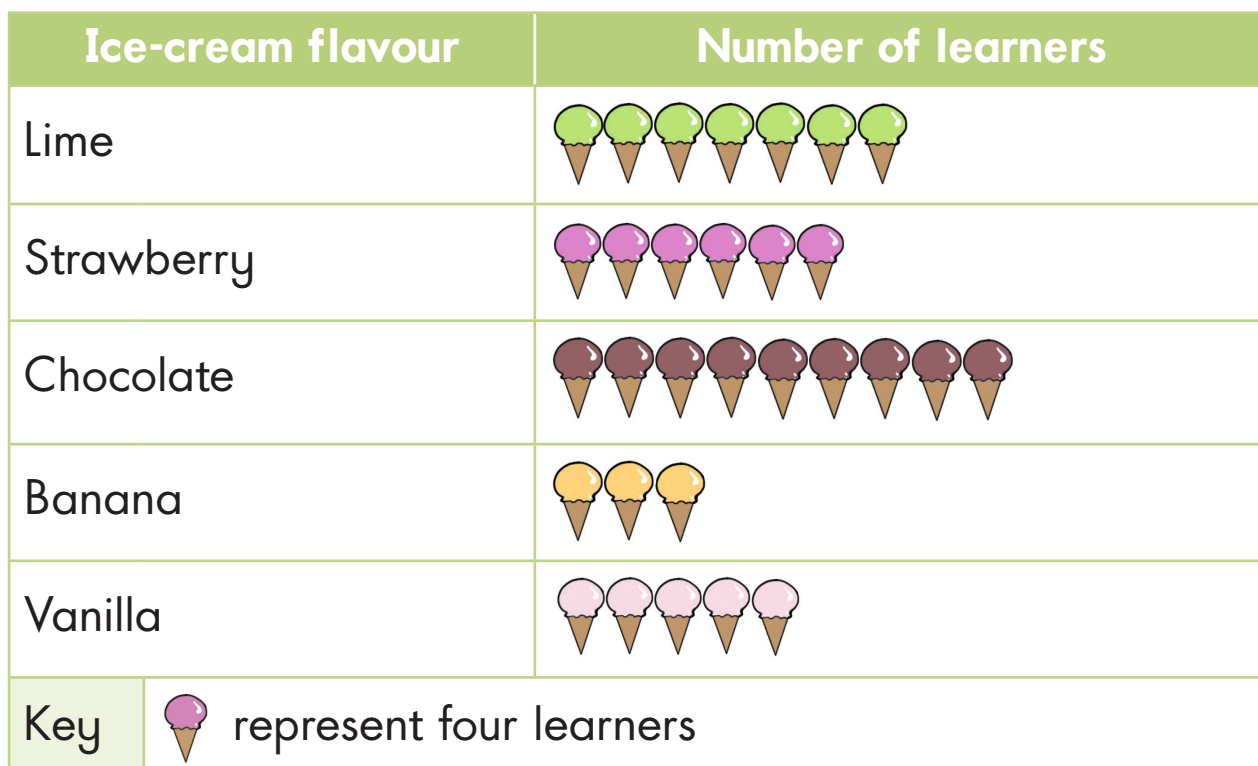


Answer

- Ice cream
- $50 - 20 = 30$
- $80 + 70 = 150$

Activity 22






























- I. The pictograph shows 60 learner's favourite ice-cream flavours.



Use the pictograph to complete the tally table.

Ice-cream flavour	Number of learners: Tally	Frequency
Lime		
Strawberry		
Chocolate		
Banana		
Vanilla		

- a) How many ice-cream flavours are there?
 - b) What is the most popular ice-cream flavour according to the survey?
 - c) How many learners prefer strawberry as an ice-cream flavour?
2. Do a survey in your class about the learner's favourite ice-cream flavours. Represent your data in a pictograph.
 3. A principal at a school used a pictograph to display the number of learners late for school during one week.

Number of learners late for school	
Monday	        
Tuesday	   
Wednesday	      
Thursday	  
Friday	    
Key	 5 learners

- a) On what day were the most learners late for school?
- b) On what day were the least number of learners late for school?
- c) How many learners were late for school on Wednesday and Thursday?

Bar graphs and pictographs

Bar graphs are useful as they help us to compare the data we collected.

Take note

Use the tally table to draw the bars to the correct height.

The bars should not touch each other. There must be a gap between the bars.

The lengths of the bars correspond to the frequency of the data group.

Example

A survey was conducted to find the number of vaccinations a group of children received by the age of 6.

The tally table and bar graph below shows the results:

Number of vaccinations	Tally
5	### //
6	### ///
7	### /
8	###
9	////

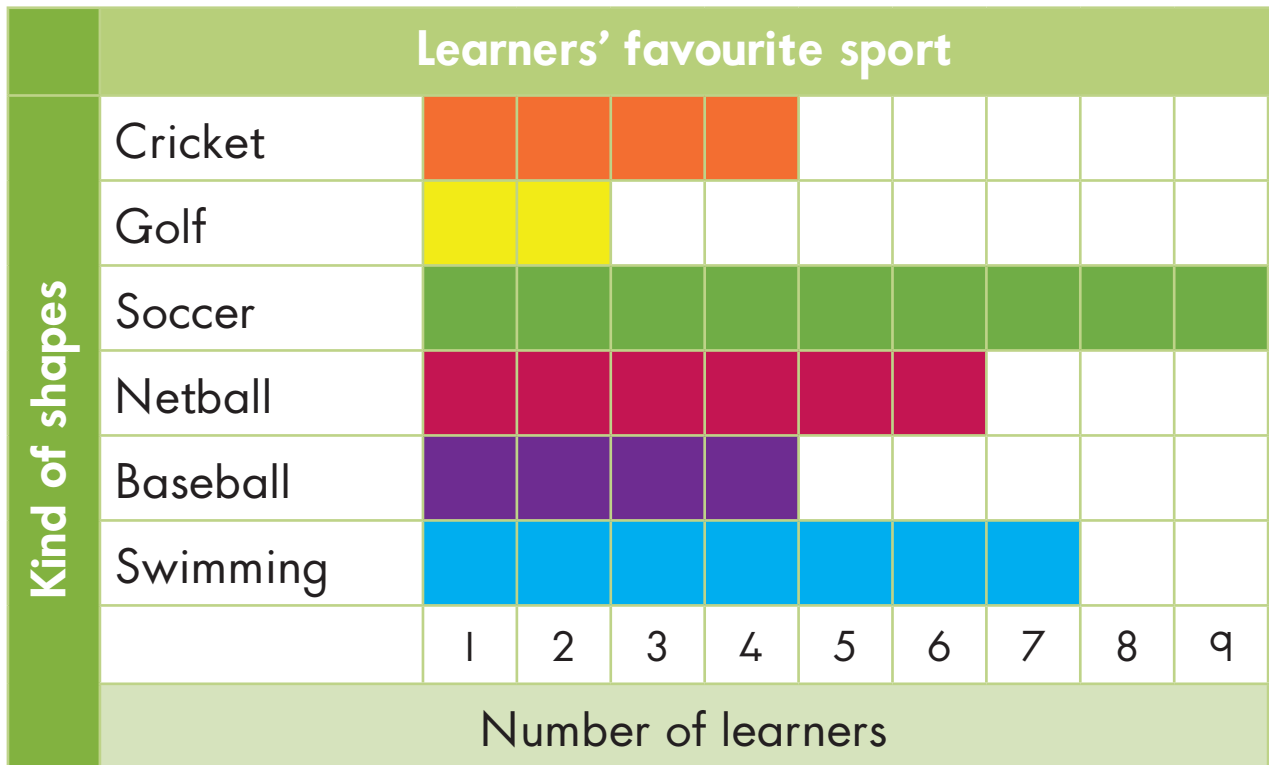
- a) How many children were counted for this survey?
- b) How many children received more than 7 vaccinations?

Answer

- a) 30 children
- b) Nine children received more than 7 vaccinations.
 $5 + 4 = 9$

Activity 23

1. This bar graph shows the most popular kinds of sport amongst the learners in Grade 3.

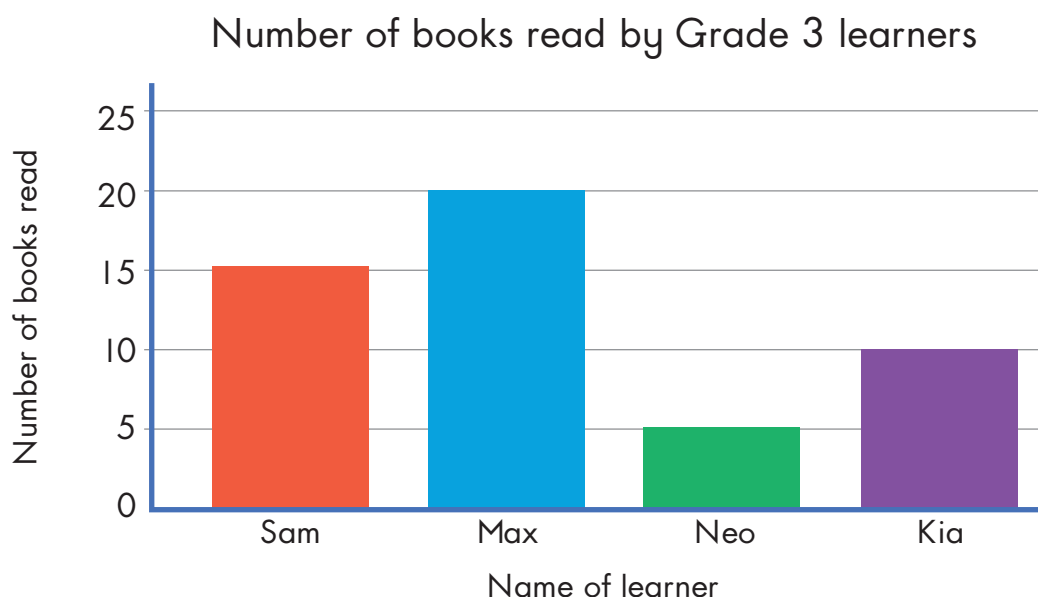


- a) Complete the tally table.
















Kind of sports	Tally marks
Baseball	
Soccer	
Cricket	

- b) What is the learners' favourite kind of sport?
- c) What type of sport is preferred by 6 learners?
- d) What is the difference between the number of learners who prefer swimming than golf?

2. The bar graph shows the number of books read by four learners in Grade 3 during a holiday.

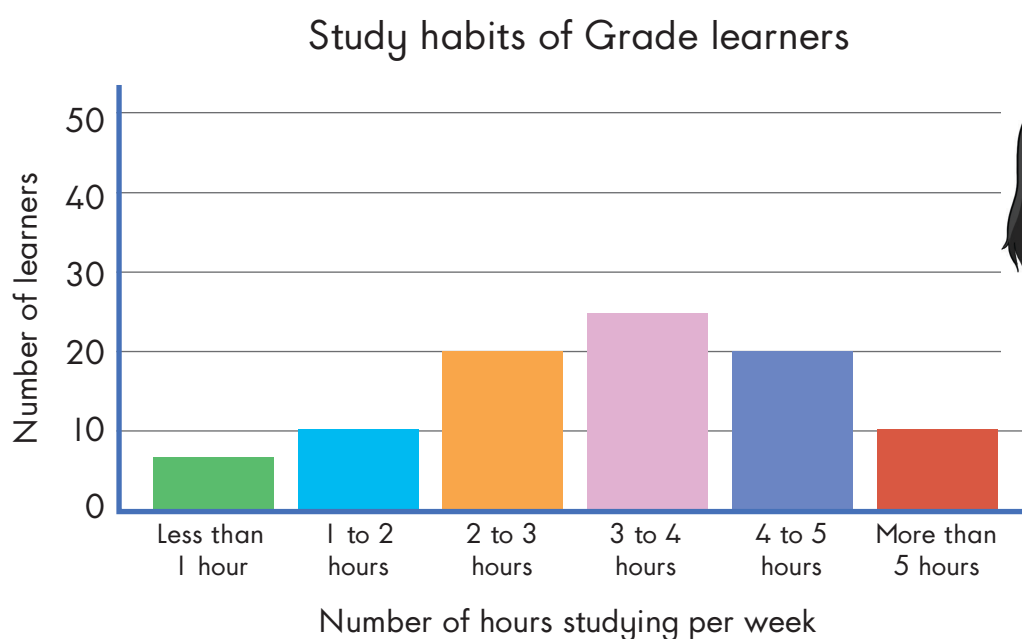


- Who read the most books?
 - Who read the least books?
 - How many more books did Sam read than Neo?
 - How many books did the five learners read all together?
3. Use the pictograph to complete the sentences below.

Weather for the last twenty days in Durban				
5				
4				
3				
2				
1				
	Sunny	Cloudy	Rainy	Thunder

- a) There were _____ rainy days.
- b) There were _____ thunder days.
- c) There were _____ more sunny days than cloudy days.

4. Look at the bar graph of the survey about the number of hours Grade 3 learners spend studying per week.




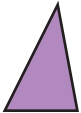

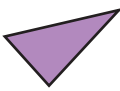













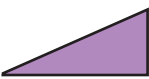



a) Use the bar graph to complete the tally table.

Number of hours learners study per week	Tally marks
Less than 2 hours	
Between 4 to 5 hours	
More than 5 hours	

- b) How many learners in total took part in the survey?
- c) How many learners study more than 4 hours per week?
- d) How many learners study less than 2 hours per week?

5. Mishka asked 21 learners in her class about their favourite shape.

The learners could choose from a circle, a triangle, rectangle or a square. She recorded the answers in a table.

- a) Complete the tally table by organising the shapes:

Tally table of learners' favourite shapes	
Circle	###
Triangle	
Square	
Rectangle	

- b) Use the information to draw a pictograph.
- c) Use the information to draw a bar graph.

Key: Use ☺ to represent a shape

Pictograph of the favourite shapes of learners

Number of learners	6				
	5				
	4				
	3				
	2				
	1				
		Circle	Triangle	Square	Rectangle

- d) Use the pictograph and bar graph to answer the following question:
- Most of the learners chose the _____ as their favourite shape.
 - Three learners chose the _____ as their favourite shape.
 - There are _____ triangles than circles.
 - There are _____ rectangles than squares.
 - What is the total number of shapes in the grid? What can you deduce from this? Complete: There are _____ shapes in the grid, therefore _____ learners were asked what their favourite shape was.
 - If three more learners were included in Mishka's survey, and all of them chose a circle as their favourite shape, draw the new tally table and bar graph to show the results.

