

JAMAICA

SAMPLE

NSC Edition

Primary Mathematics

Second Edition

Grade
4



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 hachette
LEARNING

Contents

Term 1

Unit 1: Number

Chapter ① Number value7

- Numbers in different forms9
- Working with bigger numbers10
- Large numbers11

Chapter ② Sets 18

- Sets19
- Venn diagrams 21

Chapter ③ Fraction ideas 26

- Revise what you know about fractions 27
- Unit fractions 29
- Build a fraction chart 30
- Explore equivalence 31
- Compare and order fractions 32
- More about equivalence 33
- Simplifying fractions 34
- Improper fractions and mixed numbers 35
- A fraction of a set 36
- Adding and subtracting fractions 37
- Finding the lowest common denominator (LCD) 38
- Adding and subtracting mixed numbers 39
- Problem solving with fractions 40

Chapter ④ Estimation and calculation 46

- Revisit what you know about estimating and calculating 47
- Working with base ten blocks and other materials 48
- Mental calculation 49
- Rounding off51
- Estimation 52
- The commutative property 54
- The associative property 55

Unit 2: Measurement

Chapter ⑤ Measuring length, capacity and time 59

- Length..... 60
- Estimating and measuring lengths61
- More about equivalence 62
- Distances on a map 64
- Capacity and volume 65
- Convert between measures of capacity 66
- Time 69
- Reading the time 70
- How long does it take? 71

Chapter ⑥ More about measurement 76

- Grams and kilograms 77
- Converting between units of mass 79
- Temperature 82
- Working with temperatures 83
- Calculating with units 85
- Converting between units 86

Unit 3: Geometry

Chapter ⑦ Lines and angles 91

- Revisit points, lines, paths and corners 92
- Rays and angles 93
- Measuring angles 94
- Describing lines 96
- Exploring polygons 98
- Quadrilaterals 99
- Triangles.....100
- Congruent shapes 102

Unit 4: Statistics and probability

Chapter ⑧ Statistics 108

- Graphs and tables109
- Populations and samples 111

Biased samples	112
Methods of collecting information	114
Steps for collecting data	116
PEP task	120

Term 2

Unit 1: Number

Chapter 9 Multiplication and division 125

Revisit what you know about multiplication	126
How do you remember times tables?	127
Properties of multiplication	128
Multiply by 10, 100 and 1 000	129
Multiplying in different ways	133
Two-step problems	135
More two-step problems	136
The lattice method	137

Chapter 10 Decimals 142

Revisit what you know about fractions	143
More fraction revision	144
Tenths	146
Hundredths	147
Decimals in grids and charts	149
Decimals on number lines	150
Adding and subtracting decimals	152

Unit 2: Measurement

Chapter 11 Length and area 160

Area	162
Finding areas of irregular shapes	164
Distances between places	167

Unit 3: Geometry

Chapter 12 Symmetry and position 172

Lines of symmetry	173
Exploring symmetry	174
Figures with more than one line of symmetry	175

Position on a grid	178
Slides, flips and turns	180
Slide	181
Flip	182
Turn	183

Unit 4: Algebra

Chapter 13 Patterns and variables 187

Geometric patterns	188
Patterns and rules	191
Exploring number sentences	193
Arithmagons	195
Using variables to write expressions	196
Equations	197

Unit 5: Statistics and probability

Chapter 14 Working with data 202

Explore measures of central tendency: mean, median and mode	203
Collecting and understanding information	205
Using the mean to find the total set	206
Solving problems using averages	207
Revisit what you know about graphs	209
Using different graphs	211
Representing data in another way	213
Line graphs	215
PEP task	220

Term 3

Unit 1: Number

Chapter 15 Multiplication and division 225

Division is equal sharing	226
Using a calculator	228
Explore divisibility rules	231
Division with remainders	233
The relationship between division and fractions	235

Unit 2: Geometry**Chapter 16 Properties of prisms240**

Revisit what you know	
about plane shapes	241
3D solids	242
Nets	244
Prisms	246
Why isn't it a cube or cuboid?	248

Unit 3: Algebra**Chapter 17 Using variables252**

Revisit what you know	
about solving problems	253
Algebraic expressions	254
Using algebraic expressions	
to describe patterns	255
Patterns and rules	258
Algebraic equations	
with multiple steps	259
Substitution	260
Constructing one-step	
and two-step problems	263

Unit 4: Statistics and probability**Chapter 18 Probability269**

Probability	271
The probability scale	272
Sample space	273
Probability experiments	274

Glossary and Index 280

TERM 1

UNIT 1: NUMBER

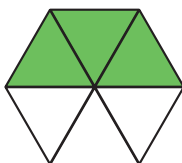
p7

Number value



Fraction ideas

Sets



Estimation and calculation

UNIT 2: MEASUREMENT

p59

Measuring length, volume and time

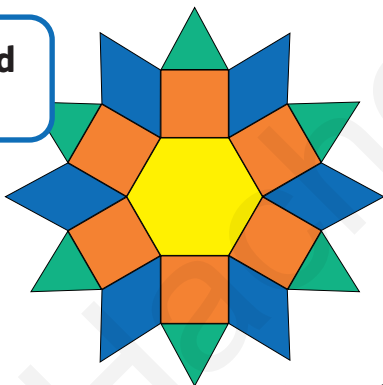


More about measurement

UNIT 3: GEOMETRY

p91

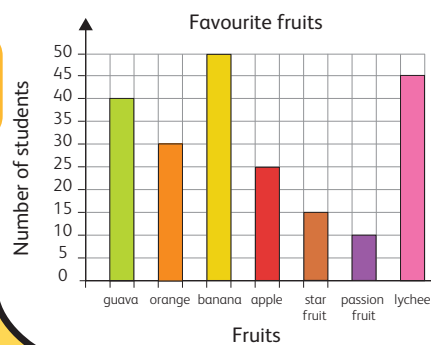
Lines and angles



UNIT 4: STATISTICS AND PROBABILITY

p108

Statistics



PEP TASK

p120

Unit 1: Number

Chapter ① Number value

In this chapter you will explore this focus question:



How do I know the value of a number?

To answer this question, you will:

- work with numbers that have up to seven digits
- distinguish between value, place value and face value.



▶▶ Starting point



- 1 Talk about the picture. What animal makes each **number**?
- 2 Which ten different numbers could you make if you only had the first three balloons?
- 3 The **face value** of the zebra is always 5. Its **value** can change depending on the position of the **digits** in a bigger number. This is called **place value**. What place value does 5 have in each of these numbers:

a 3 015

b 580

c 5 600

Key words

number
face value
value
digit
place value

- 4 Start a small notebook for maths definitions and examples.
Draw or write definitions of value, face value and place value.
- 5 Use the picture of the balloon numbers on the previous page. Which animal balloons would you use to make these numbers:
 - a two thousand, four hundred, forty-seven
 - b five thousand, three hundred, six
 - c eight thousand nineteen.
- 6
 - a Choose four of the animal balloons. Write ten different 4-digit numbers with them. You can use each animal as many times as you like in each 4-digit number.
 - b Write the numbers in ascending order (from smallest value to largest value).
- 7 We express a part of the whole using fractions, such as one half or $\frac{1}{2}$. Use what you know about fractions to complete these sentences.
 - a $\frac{3}{10}$ of the balloons are ____.
 - b ____ of the balloons are black-and-white.
 - c ____ of the balloons are orange.
 - d ____ of the set is brown.
- 8 Round the numbers you wrote in Exercise 3 off to the nearest thousand.

Remember to look at the hundreds digits. If it is 5 or more, round up.
If it is 4 or less, round down.



Maths detective: Find the mistake!



Work with a partner. Each person writes a 3-digit number and five different number sentences, which give that number as a sum or difference. One of your number sentences should have a mistake. Get your partner to find the mistake!

Numbers in different forms

Key maths idea



You can write numbers in different ways.

Using **standard form**: 4 627

In a place value chart:

Thousands	Hundreds	Tens	Ones
4	6	2	7

Expanded form: $4\,000 + 600 + 20 + 7$

Word form: four thousand, six hundred, twenty-seven



Standard form uses digits to show value of a number.

Key words

standard form
expanded form
word form

- Are the numbers given below in standard form, expanded form or word form? Write the form and then write the number in numerals.
 - ten thousand one
 - 6 054
 - $7\,000 + 200 + 90 + 8$
 - $8\,000 + 800 + 4$
 - three thousand thirty-one
 - 740
- Write these numbers using standard form.

a ten	b $10 + 5$	c twenty
d $100 + 10 + 0$	e $300 + 50 + 7$	f four hundred seventy-five
g one thousand	h five thousand three hundred	i $8\,000 + \text{eighty-three}$
- Write the following numbers in expanded form.
 - five thousand fifty-five
 - eight thousand twenty-eight
 - one thousand, two hundred, nineteen

Working with bigger numbers

Key maths idea



$$10 \times 1\,000 = 10\,000$$

We say ten thousand.

$$10 \times 10\,000 = 100\,000$$

We say one hundred thousand.

$$10 \times 100\,000 = 1\,000\,000$$

We say one million.

When you work with bigger numbers, it is important to look at the place value. The digit furthest to the left has the **greatest** place value. That means it has the **largest** value. The digit furthest to right has the smallest, or **least**, value.

Look at this number expressed in standard form: 1 435 605

Expanded form: $1\,000\,000 + 400\,000 + 30\,000 + 5\,000 + 600 + 5$

Here is the place value chart:

M	Hth	Tth	Th	H	T	O
1	4	3	5	6	0	5

Word form (read the millions first): **1 million, four hundred thirty-five thousand, six hundred, five**

Key words

greatest

largest

least

- 1 Write the following numbers using numerals.
 - a two hundred thousand twenty-five
 - b five million fifty-three
 - c three million, three hundred thousand, thirty
 - d one million, two thousand, eight
- 2 Write the following numbers using standard form.
 - a $7\,000\,000 + 500\,000 + 40\,000 + 6\,000 + 10 + 9$
 - b $400\,000 + 7\,000 + 600 + 20 + 4$
 - c $2\,000\,000 + 700\,000 + 60\,000 + 1\,000 + 500 + 10 + 9$
 - d $4\,000\,000 + 800\,000 + 4\,000 + 500 + 10$
- 3 Write the following numbers in expanded form.
 - a 4 678 932
 - b 702 944
 - c 3 659 021
 - d 9 999 999

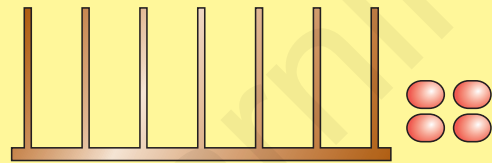
Maths detective: Large numbers

Case 1

- 1 Work in pairs. Write down ten 6-digit numbers you can make using only the digits 1 and 2.
- 2 Write them in order from least to greatest.
- 3 Compare with another pair.

Case 2

- 1 Look at the abacus. Make four different numbers. Draw your answers and write the numbers you made.
- 2 Now write the numbers in order from largest to smallest.



Large numbers

Key maths idea



When do we use large numbers?
Use the pictures to help you.



Key words

population
census
questionnaire
information

We use large numbers to talk about the **population** of a country. The Jamaican government holds a **census** every ten years to find out the population size. Each household has to fill in a **questionnaire**. A questionnaire is a list of questions that we use to collect information on a particular topic. The census provides **information** about the population and helps the government to plan its services.

Population of Jamaica



Parish	Population (2018)	Parish	Population (2018)
1 Kingston and St Andrew	669 773	8 Hanover	70 265
2 St Thomas	94 939	9 Westmoreland	145 628
3 Portland	82 643	10 St Elizabeth	151 839
4 St Mary	114 867	11 Manchester	191 881
5 St Ann	174 203	12 Clarendon	247 702
6 Trelawny	75 981	13 St Catherine	521 249
7 St James	185 697		
Total population	2 726 667		

(Source: Statistical Institute of Jamaica, adapted from: https://statinja.gov.jm/Demo_SocialStats/EndofYearPopulationbyParish.aspx)

- 1** Use the information in the table to answer the following questions.
 - a** Which parish has the largest population?
 - b** Which parish has the smallest population?
 - c** What is the total population of Jamaica?
 - d** Choose 2 parishes that would have over 1 000 000 people if they were added together.
 - e** How many more people live in parish 3 than in parish 8? Show how you work this out.
 - f** Write the population numbers of parishes 2 to 6 in ascending order.
 - g** Add together the populations of parishes 4, 5 and 6.
- 2** Draw a place value chart and put the smallest population number digits in the correct columns.
 - a** Write the number in expanded form.
 - b** Write the face value for each digit.
 - c** Write the place value for each digit.
- 3** Draw another place value chart and put the total population number in the correct columns.
 - a** Write the number in expanded form.
 - b** Write the number value for each digit.
 - c** Write the place value for each digit.



Real-world maths: Number of students in a school

- 1 Why is it important to know how many children are at your school? Discuss this with your class.
- 2
 - a Make a questionnaire to find out the number of students and staff at your school, and how many children are in each class and grade.
 - b Use the questionnaire to collect the information.
- 3 List the following results:
 - a What is the total population of the school?
 - b How many of these are students and how many of these are staff?
 - c Which is the largest grade group?
 - d What is the difference in numbers between the largest and smallest grade group?



Real-world maths: Making big purchases

Choose one of the following problems to investigate.

- 1 Malia needs to buy a car for her cupcake business. These are her requirements:
 - It should be a hatchback so that she can easily pack deliveries into the back.
 - It must be no older than 3 years.
 - It must have less than 20 000 km mileage.
 - The budget is maximum \$3 250 000.



Use a newspaper or look online (for example, jamaicars.com). Identify three possible cars Malia could buy that would fit her requirements.

Discuss with a partner which would be the best buy.

- 2 Your family wants to buy a new big-screen TV set.
 - The screen must be 55 inches or larger.
 - It must be a smart TV, with WiFi and Bluetooth.

Use the newspaper or internet to identify three possible products at different prices. Compare the prices and explain why each is cheaper or more expensive than the others. Identify which is the best buy and explain why you would choose that one.

Real-world maths: A museum visit

A visit to the Bob Marley Museum in Kingston costs a family of three \$5 500. If they paid for it with 1 000-dollar bills, how many would they need? If they paid with 500-dollar bills, how many would they need? If they paid with 100-dollar bills, how many would they need?

Maths detective: Code crackers

Now use your skills to solve these cases!

Case 1

Chris Anderson scored over fifteen thousand runs in One Day International test cricket. The secret number is a whole number with 5 digits. The digit in the ones place is the product of 3×3 . The digit in the hundreds place is an even number that is smaller than 8 but larger than 4. The digit in the thousands place is equal to the quotient of 21 and 3. The digit in the ten-thousand place is the numerator in every unit fraction and the digit in the tens place is a factor of 10, 15 and 20. Using all the clues you should know the amount of runs by now.

- 1 What is the secret number?
- 2 Write the secret number in word form.

Case 2

Now see if you can find this number:

I am a 4-digit number between 5 500 and 7 000.

I am odd.

I am a multiple of 5.

The digit in the thousands place is 1 more than the digit in the ones place.

The sum of my digits is 19.

The digit in the tens place is 3 more than the digit in the ones place.

Which number am I?

Case 3

Can you find this number?

I am a 4-digit number.

I am even.

The digit in the ones place is 3 times larger than the digit in the thousands.

The digit in the tens place is 5 less than the digit in the ones place.

The digit in the hundreds place is 8 more than the digit in the tens place.

The sum of my digits is 18.

Which number am I?

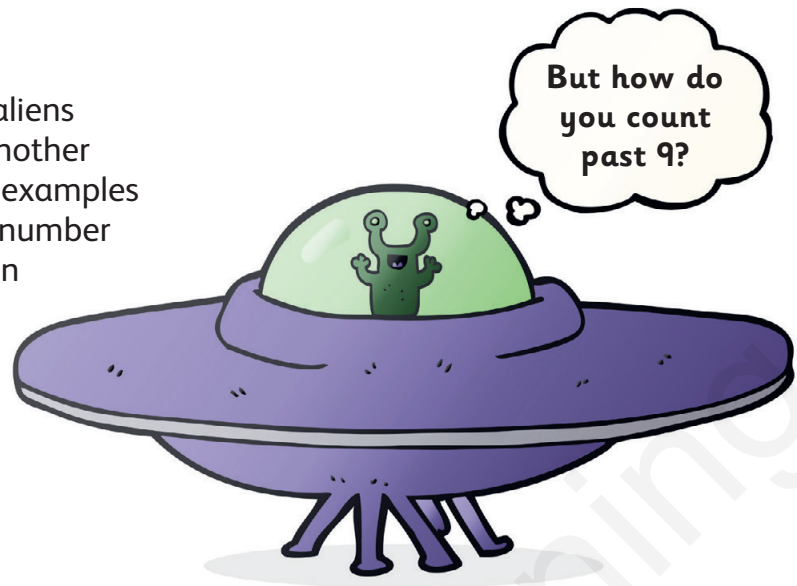
Calculate a value for each of the letters of the alphabet. Then use these values to help you crack the code and read the message below.

A	the digit in the thousands place of 415 925		M	10×5 makes this product	
C	the place value of the 7 in the number 24 718		N	1 quarter of 1 000	
D	10 of these make 400		O	the first even number	
E	the greatest 1-digit number		P	the digit in the hundred thousands place in the number 4 352 129	
F	the only digit that is not a natural or counting number		S	the number of digits in five thousand	
G	the greatest 2-digit number		T	the smallest 3-digit number	
H	the face value of the 1 in the number 1 million		U	5 of these make one hundred	
I	the number of digits in the number 2 153 990		W	the number that multiplied by itself makes 100	
K	the number of digits in half a million		X	if you divide 4 000 by ten, you get this	
L	the digit in the thousands place in 1 982 571		Y	half of 1 000	

[illegible]

What I have learned

Imagine that a spaceship full of aliens has arrived at your school from another planet. Use diagrams and simple examples to explain to them how we use a number system with ten numerals that can show numbers big enough to represent the distance between their planet and ours.



Practice questions

- 1
 - a Write the smallest possible 7-digit number you can using the digits 1, 5, 7 and 2. All digits need to be used at least once.
 - b Now write the greatest possible 7-digit number using the same digits.
 - c Use one of the numbers you made to explain the difference between face value, place value and value of a number.
 - d Use one of the numbers you made to show how we write a number in expanded form.
- 2 Explain in your own words what we mean by:
 - a standard form
 - b expanded form.
- 3 Give three examples of things that cost more than \$1 million.
- 4 Write the value of 6 in each number.

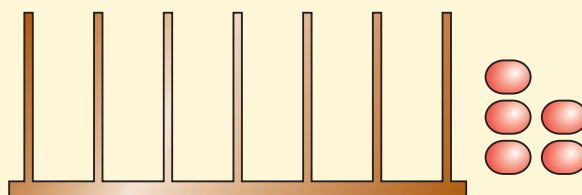
a 609 773	b 94 639	c 685 597
d 4 892 306	e 6 987 032	
- 5 Draw a place value chart. Fill the numbers in on the chart.

a 4 533	b 56 709	c 345 981
d 9 882 431	e 602	f 44 320
- 6 Write this set of numbers in numerals, then order from smallest to largest.

- eighty-two thousand, seven hundred, eighty-four
- two hundred forty-seven thousand, four hundred, fifteen
- six million, six hundred six thousand, eight hundred, fifty-five
- four million, seven hundred ten thousand, three hundred, one
- three million, seven hundred thousand, forty

7 Look at the abacus and answer the questions.

- a** What is the largest number you can make using 5 beads? Draw your answer and write the number.
- b** What is the smallest number you could make? Draw your answer and write the number.



1 Self check

Check you can do this: 	If you have difficulty, try this: 
1 Write any 4-digit number. Give the value, place value and face value of each digit. Try it with this number: 5 847	Go to page 7 and revise what we mean by place value, face value and value.
2 Can you identify the value of numbers with 5, 6 or 7 digits? Try it with these numbers: 12 384 349 750 1 438 885	Go to page 10 and practise putting numbers into place value charts to identify the value of each digit.
3 Can you put numbers into expanded form? Try it with this number: 8 156 209	Go to page 9. Think about expanding each digit to show its full value and expressing it as an addition sum.
4 Give some examples of when we need to use 7-digit numbers. Think of two things we might buy that might have 7-digit prices.	Go back to pages 10 and 11 and refresh your memory!

Chapter 2 Sets

In this chapter you will explore this focus question:



What do I need to know about sets?

To answer this question, you will:



- describe sets, explain what sets are
- list elements or members of a set
- name sets using curly brackets (also called braces).

▶▶▶ **Starting point**

- 1 Look at the **set** of objects in the picture.
 - a What **similarities** and **differences** do you notice?
 - b How could you **group** the objects differently?
 - c Equivalent sets have the same number of **members**. Which equivalent sets can you see in the picture?



- 2** Your teacher will give you sets of notes and coins. Work out the value of each set. Explain how you worked it out.

- 3** Look carefully to find and match the equivalent sets.

Set A = {2 000, 500, 20, 1}

Set B = {5, 100, 50, 1 000}

Set C = {5 000, 1, 10, 20, 50}

Set D = {20, 10, 5, 1}

Set $E = \{1, 10, 20, 50, 5\,000\}$

Set $F = \{5, 10, 20, 1\}$

Set $G = \{500, 1, 20, 2\,000\}$

Set $H = \{50, 5, 100, 1\,000\}$

Remember:
members are
the objects or
items in a set.

Key words

- set
- similarities
- differences
- group
- members

Sets

Key maths idea



We **sort** objects into sets according to **attributes** such as size, shape, colour, texture or type of item. Each item in a set is called a **member** or **element** of the set. The picture shows a set of 10 paper clips. They are all the same shape and size, and the same type of item. There are 10 members in this set.

Set A



We name sets using capital letters. We list the members of a set in **curly brackets** (also called **braces**) and put a comma between each member. This is called **set notation**. For example, Set B is a set of five different ways to travel.

Set B = {car, bus, train, aeroplane, ship}

curly brackets
or braces

member or
element

comma

Set C is the set of counting numbers less than 7.

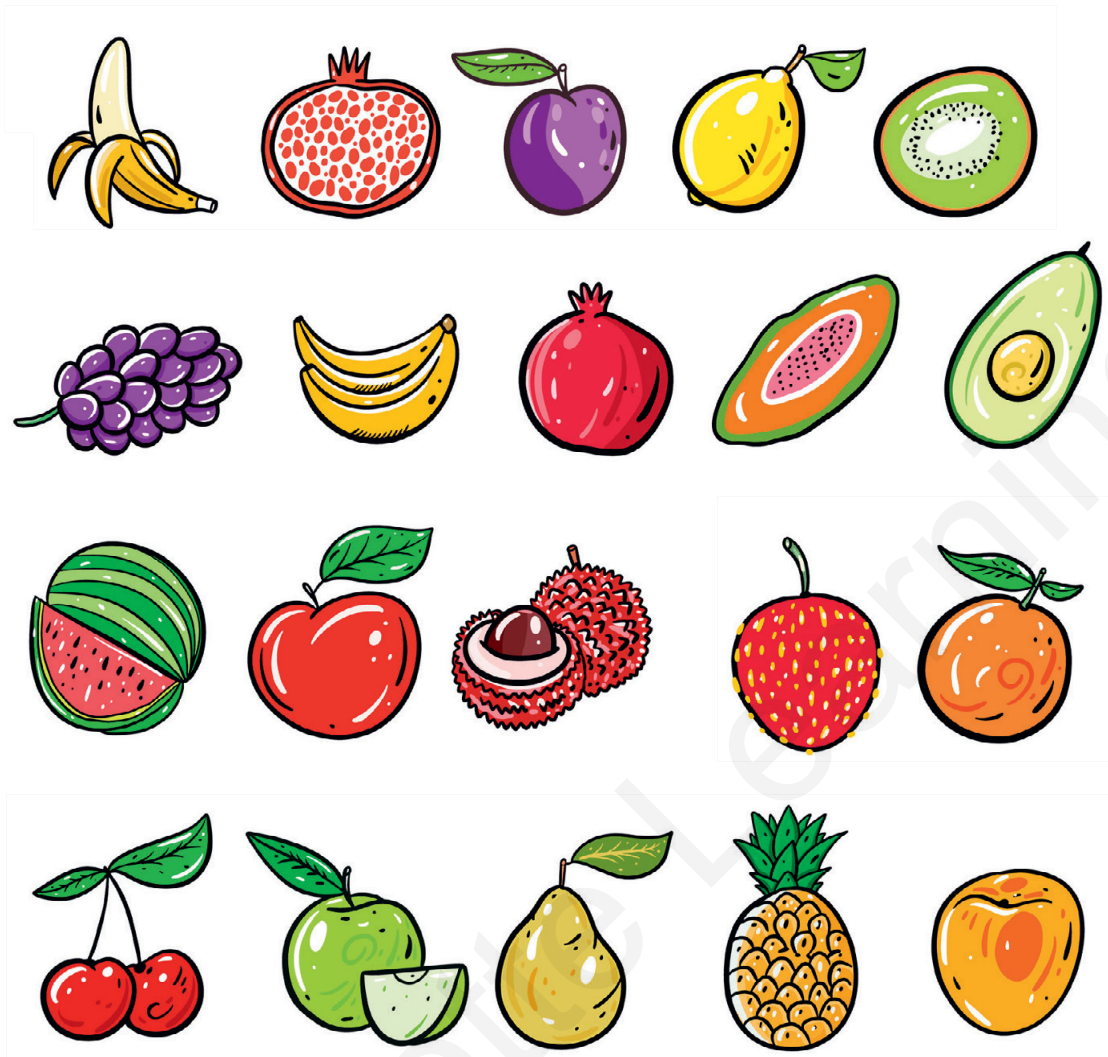
Set C = {1, 2, 3, 4, 5, 6}

Key words

sort
attributes
member
element
curly brackets
braces
set notation

Remember: a set has members or elements that share the same attribute.

- 1 Use set notation to show these sets. The first one has been done for you.
 - a Set P is the set of whole numbers greater than 12 and less than 20.
Set P = {13, 14, 15, 16, 17, 18, 19}
 - b Set M is a set of any three kinds of flower.
 - c Set D is a set of five names that start with D.
 - d Set R is the set of days of the week.
- 2 Describe each set in your own words. The first one has been done for you.
 - a Set Y = {bananas, egg yolks, sunflowers}
Set Y is a set of things that can be yellow.
 - b Set E = {puppy, kitten, lamb, duckling}
 - c Set V = {mobile phone, computer, tablet}



- 3
 - a Group the fruits according to similar attributes to make a few different sets.
 - b Write sentences to describe what makes the members in each group a set.
 - c Work with a partner to find at least one different way to group the elements to form different sets.
- 4 Use set notation to write these sets.
 - a Set W is a set of 6 wild animals.
 - b Set N is a set of 5 names – each name has more than 6 letters.
- 5 Look around your classroom. List 15 objects you can see around you.
 - a Group them according to similarities.
 - b Explain to a partner what makes these objects members of a set.
- 6 Your teacher will show you a bag of objects. Take one object from the bag. Say which other objects you could put together with this object to make a set with shared attributes. Draw a picture of your set.

Venn diagrams

Key maths idea



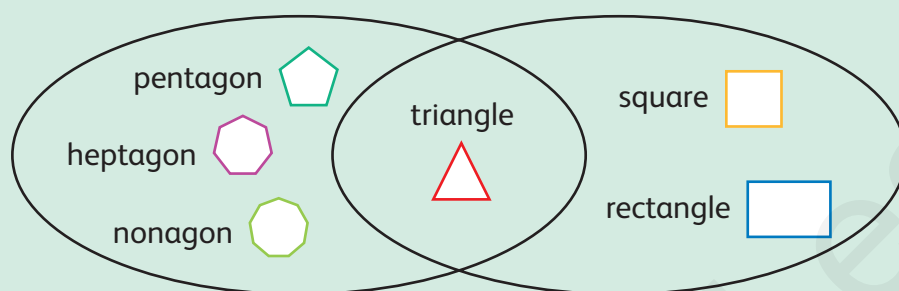
A **Venn diagram** shows the members of one or more sets. It uses circles or rings. Each ring represents a set. Elements inside each ring belong in that set. Elements in the **overlapping** area belong to both sets. Elements outside of the ring are not members of the sets. Here is an example.

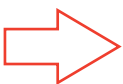
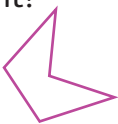
Key words

Venn diagram
overlapping

Set P = shapes with an odd number of sides

Set F = shapes with four sides or fewer



- 1 Talk about the sets shown above.
 - a How many elements are in set P?
 - b How many elements are in set F?
- 2 Into which set would each of these shapes fit?
 - a 
 - b 
 - c 
- 3 Draw another shape that could belong to set F.

Real-world maths: Make a scrapbook



Make a scrapbook of sets as pages.

- 1 Look at the magazines and advertising pages/leaflets/flyers that your teacher has given you. Cut out pictures of things you think you can make sets with. Glue them in their sets.
- 2 Name your sets. Write sentences to describe what makes the members in each group a set.

You will need:

- magazines and printed advertisements
- scissors
- glue
- blank pages.

Real-world maths: Art supplies



Imagine that your school has decided to set up an art room where children can do painting, drawing and clay modelling. You need to draw up a list of supplies.

1 Draw set diagrams for these sets:

- Set A = painting materials
- Set B = drawing materials
- Set C = useful tools for crafts
- Set D = items for keeping clean and neat
- Set E = storage containers.

In each set, write at least three elements that fit into that set.

2 Which elements would belong to:

- a both set A and set B?
- b both set C and set D?



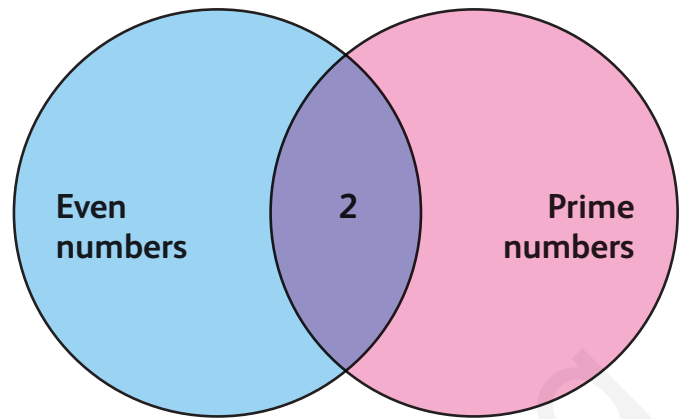
- | Games | Dice | Board | Ball | Bats/Rackets | Pieces |
|-------|------|-------|------|--------------|--------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

What I have learned

Look at this diagram of two sets.

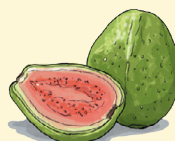
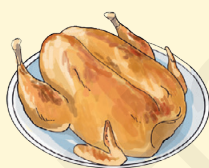
Write a paragraph that gives the following information:

- what kind of diagram this is
- what it shows
- why there can only be one element in the overlapping area.



Practice questions

- Decide whether each sentence is true or false. If it is false, correct the statement.
 - A set is a collection of objects that have something in common.
 - The objects in the set are called its parts.
 - Curly brackets (braces) are used to show that the objects written between them belong to a set.
 - Pens, pencils, sugar, erasers and books could be elements of the same set.
 - A duck, pigeon, flamingo, eagle and ostrich could be members of the same set.
- Name each of these sets and write them in set notation.
 - even numbers between 52 and 62
 - odd numbers between 13 and 31
- Look at these pictures of food and drink that people like. Find a way to group them into three sets. Use set notation to describe the sets.



Remember:
set notation means naming the set with a capital letter and writing the elements in curly brackets.

4 Akiel grouped these numbers in a set:

$\{0, 1, 2, 3, 4, 5\}$

a Describe this set in words.

b Create your own set of numbers. Remember to use curly brackets around the numbers. Swap sets with a partner and describe each other's sets.

2 Self check

Check you can do this: 	If you have difficulty, try this: 
1 Explain what a set is. Use the words set, element, belong.	Go to pages 18 and 19 and revise sorting objects into groups according to attributes.
2 Describe a set. Try it with this set: Set A = $\{0, 2, 4, 6, 8, 10\}$	Go to page 19. Exercise 1 describes sets for you to write in set notation. Exercise 2 gives set notation and gives you the opportunity to describe each set.
3 Name sets using curly brackets (braces) and list members of a set. Try it with this set: a set of any three animals that people keep as pets.	Go back to pages 18 and 19.

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