Collins

Book B

English for Mathematics

Linda Glithro
Karen Greenway
Series Editor: Mary Wood

NTV
Công ty TNHH
Nhân Trí Việt

NHÀ XUẤT BẢN TỔNG HỢP
THÀNH PHỐ HỒ CHÍ MINH

Introduction

This series of books is aimed at non-native English speakers who attend English language mathematics lessons in primary school. The books aim to support those who find the language used in the lesson unfamiliar and challenging.

Some of the language of mathematics is rarely used outside the classroom. It may, hence, be unfamiliar to those students who don't speak English as their first language. In some cases, words and phrases can have a different meaning in the mathematics classroom to their meaning in common usage. This can lead to confusion and frustration and can hinder progress.

The *English for Mathematics* series aims to teach students the language used for mathematics taught in primary school. Key words and language structures are explained, using diagrams and illustrations to aid understanding. The 'Wise Owl' gives tips and hints on how to use the language, allowing learners to check their understanding. Carefully graded activities linked to the topic and the focus vocabulary give opportunities to practise using the language.

Each of the 36 units includes notes to teachers or parents, which give ideas for how to present the language and topics to learners. The books can be used in class alongside the main textbook, or at home for further practice and reinforcement.

The clear, easy-to-use layout together with the appealing and helpful pictures and diagrams will help de-mystify the English of mathematics.

Mary Wood, Series Editor

English for Mathematics: Book B

Linda Glithro and Karen Greenway

Contents

Number

Geometry

Measures

Data handling

Partitioning numbers

Read it!

Key words: digit, place value, thousand, zero, place value holder, partition, ten thousand (10 000)

The position of a **digit** in a number gives its **place value** or size.

Th	H	T	U
6	0	4	3

The 6 has a value of 6000 or 6 thousands.

The 3 is 3 units.

There are no hundreds, so zero is used as a place value holder.

The 4 has a value of 40 or 4 tens.

The 6 has a place value of 6000 or 6 thousands.
There are no hundreds, so **zero** is used as a **place value holder**.
The 4 is 40 or 4 tens.
The 3 is 3 units.

Partitioning a number breaks it into parts.
Example:
Instruction: Partition 3125.
Answer: 3125 = 3000 + 100 + 20 + 5

Remember each place is 10 times the value of the place to its right.

ten thousand

TTh	Th	H	T	U
1	0	0	0	0

× 10 × 10 × 10 × 10

1 ten thousand = 10 × 1 thousand

Language focus

Everyday meaning of **digit**: a finger, thumb or toe

Mathematical meaning of **digit**: any of the numerals 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9

Think about it!

1. Describe the place value of the 5 in these numbers.

4581 _____ 5109 _____ 1285 _____

2. Finish partitioning these numbers.

(a) 8452 = 8000 + _____ + _____ + 2

(b) 6703 = _____ + 700 + _____

Practise it!

1. (a) Write these numbers in figures.

One thousand nine hundred and sixteen _____

Three thousand four hundred and two _____

Six thousand and eighty-four _____

(b) Write these numbers in words.

5739 _____

7094 _____

2810 _____

2. (a) Partition these numbers.

4759 = _____ + _____ + _____ + _____

3602 = _____ + _____ + _____

8015 = _____

(b) Put these partitioned numbers back together.

2000 + 800 + 40 + 3 = _____

7000 + 300 + 4 = _____

9000 + 80 = _____

3. Here are four digit cards.

Using all four of these cards what is …

(a) the largest number you can make? _____

(b) the largest even number you can make? _____

(c) the smallest number you can make? _____

(b) the smallest odd number you can make? _____

Teachers' and parents' note

Look for numbers to read, write and discuss in everyday life. Remind students to read numbers from the left. You start with the digit that has the largest place value. 2609 is two thousand six hundred and nine. Make sure that they remember to use zero as a place value holder. Four thousand and sixty is 4060 and ten thousand is 10 000.

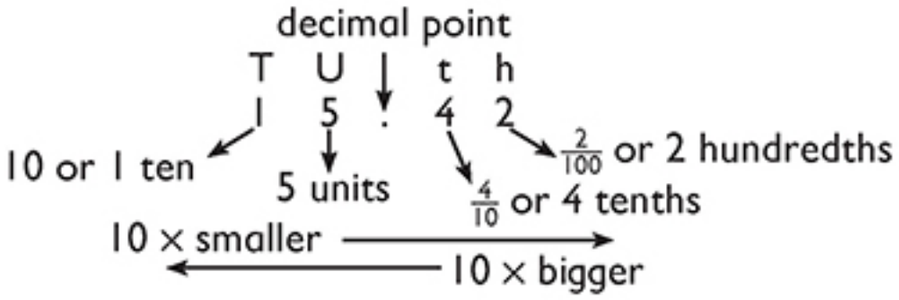
Decimal numbers

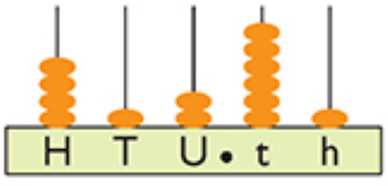
Read it!

Key words: decimal, decimal point, tenth, hundredth, decimal place

A **decimal** (or decimal number) is a number containing a whole number part and a fraction part.

The **decimal point** separates the whole number part from the fraction.





Example: represents the number 412.61.

This number has 4 hundreds, 1 ten, 2 units, 6 tenths and 1 hundredth.

Language focus

The first **decimal place** shows the number of **tenths** (t).

The second **decimal place** shows the number of **hundredths** (h).

A centimetre is one hundredth of a metre.
1 metre + 25 centimetres = 1.25 metres
1.25 m = 125 cm

Think about it!

1. What is the value of the seven in these numbers?

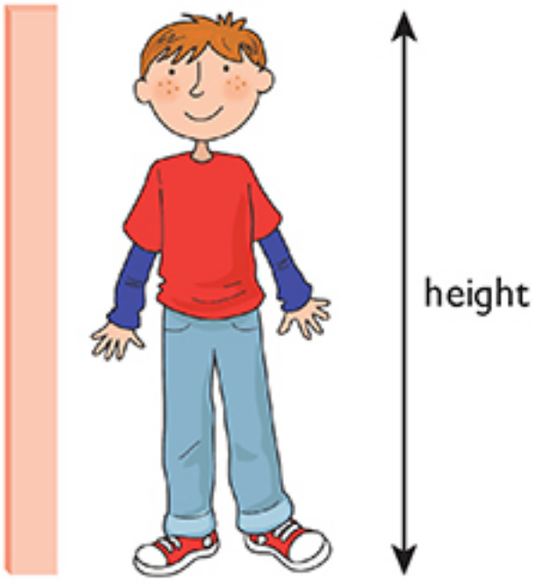
(a) 3.72 _____ (b) 7.43 _____ (c) 1.87 _____

2. Change these amounts from metres to centimetres.

(a) 2.65 m = _____ (b) 0.90 m = _____ (c) 1.04 m = _____

Practise it!

1.



Ali is 115 cm tall, which is equivalent to 1.15 m.

What is the height of these children in metres?

(a) Anton 124 cm = _____ (b) Bruno 131 cm = _____

(c) Conrad 109 cm = _____

2. Complete the table for the number 184.39.

The first row has been done for you.

tens	8
units	
hundreds	
tenths	
hundredths	

3. Put these lengths in order, starting with the largest.

1.99 m 655 cm 5.45 m 200 cm

_____

Teachers' and parents' note

The end of the word 'hundredths' is challenging to pronounce even for native English students. The three sounds /d/ /th/ /s/ require you to move your tongue into three different positions. You could make it a game, emphasising the pronunciation, perhaps using a mirror. At the same time, revise the mathematical definition as the position of the second digit to the right of the decimal point equal to $\frac{1}{100}$.

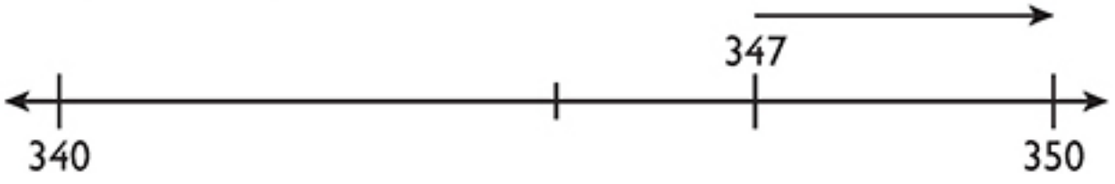
Rounding numbers

Read it!

Key words: round (a number to …), between (halfway between), closer to, closest to

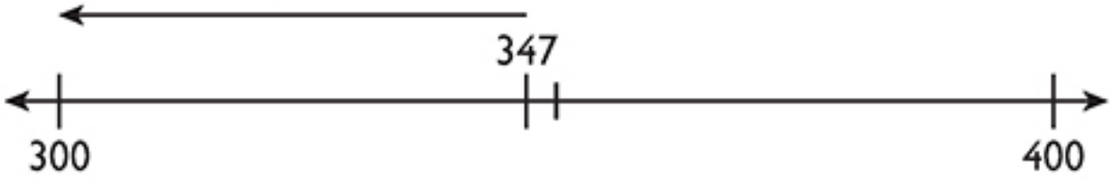
Rounding a number makes a simpler number. It is less accurate but easier to use. The number is still close to what it was.

To round to the nearest 10, round down a units digit of 4 or less, and round up a units digit of 5 or more.



347 is **between** 340 and 350 but **is closer to** 350.
347 is 350 when rounded to the nearest 10.

To round to the nearest 100, round down a tens digit of 4 or less, and round up a tens digit of 5 or more.

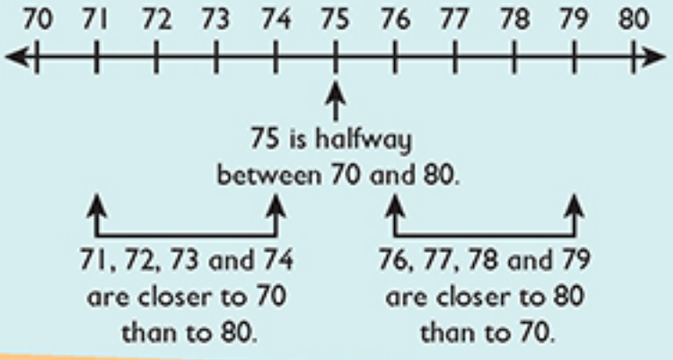


Example:
Question: What is 347 rounded to the nearest 100? (Look at the tens digit.)
Answer: 300 (347 is rounded down to 300 because 4 tens are nearer to 300 than 400.)

Language focus

Between, halfway between, closer to

The whole numbers 71, 72, 73, 74, 75, 76, 77, 78 and 79 are between 70 and 80.



5 is exactly in the middle, but the rule is that the digit 5 is always **rounded up**.

Think about it!

1. Round these numbers to the nearest 10.

(a) 432 _____ (b) 567 _____ (c) 408 _____

2. Round these numbers to the nearest 100.

(a) 762 _____ (b) 639 _____ (c) 527 _____

Practise it!

1. Tick (✓) the number that is closest to 500.

538 485 5050 490 515

2. Complete the table.

	Rounded to the nearest 10	Rounded to the nearest 100
493		
3465		
752		
6056		

3. Mia is rounding numbers to the nearest 10.

Her answer is 650.

List **all** the whole numbers she could round.

_____

Teachers' and parents' note

Ask individual students to explain to you how they would round a number to the nearest 10 (100). Remind them that they can use a number line to make it clear. 'Teaching' another person is an excellent way to develop understanding.

Comparing numbers

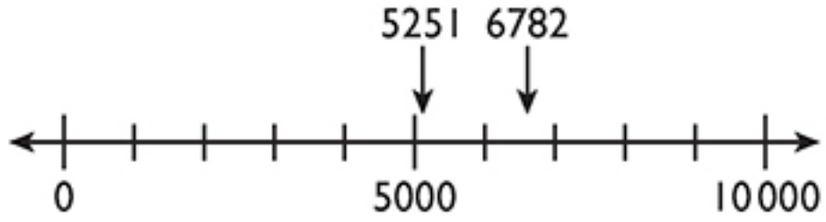
Read it!

Key words: compare, size, number line, order, greater than (>), less than (<)

You **compare** numbers by looking at the difference in their **size**, for example, 125 is less than 152.

To **compare** and **order** 4-digit numbers, look at the thousands digit, then the hundreds digit, then the tens digit and finally the units digit.

Example: Here are four numbers: 5251 6782 5673 5256
Instruction: Arrange the numbers in order of size starting with the smallest number. Estimate the positions of the smallest and largest numbers on a 0–10 000 number line.
Answer: 5251, 5256, 5673, 6782



0–10 000 **number line** marked in multiples of 1000

Language focus

equal	=	3 + 6 = 4 + 5
greater than	>	3 + 6 > 4 + 3
less than	<	3 + 6 < 4 + 9

8 > 6 This says: 'Eight is **greater than** six.'

6 < 8 This says: 'Six is **less than** eight.'

We can order numbers in a list or show the order using the < and > signs.
5673 > 5256 > 5251
or
5251 < 5256 < 5673

Think about it!

Write > or < in the box to make these statements correct.

(a) 9032 ☐ 8965

(b) 4512 ☐ 4152

Practise it!

1. Write > or < in each circle.
Then write a whole number that comes in between each pair.

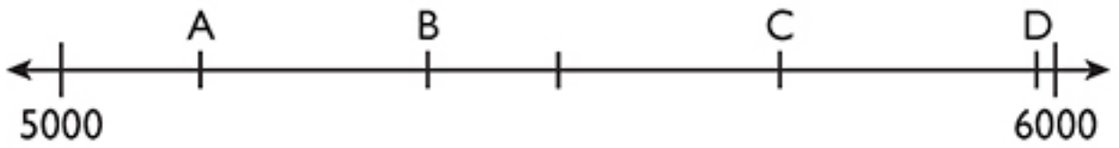
(a) 3569 ◯ 3659 _____

(b) 7111 ◯ 799 _____

(c) 2099 ◯ 2101 _____

(d) 6407 ◯ 6079 _____

2. Match each letter to the correct number.



5723 is _____; 5140 is _____; 5981 is _____; 5369 is _____

3. Here are 4 digit cards.

(a) Write all the 4-digit numbers greater than 7000 that can be made using all 4 cards.

_____

_____

(b) Put the numbers you made in order of size starting with the smallest.

_____

_____

Teachers' and parents' note

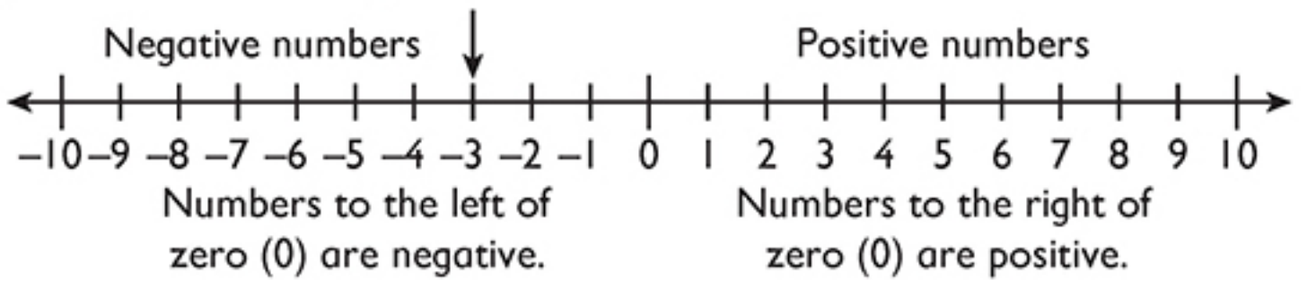
Look for opportunities to compare numbers. Ask questions like: Were there more people at the football match this month than last month? Which river is the longest? Which village has the greater population?

Negative numbers

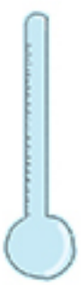
Read it!

Key words: negative number, positive number, zero, temperature

A **negative number** is less than **zero** (0). It is written with a minus sign.
A **positive number** is greater than zero.



A thermometer is an instrument for measuring **temperature**.
Temperatures are measured in degrees Celsius (°C).

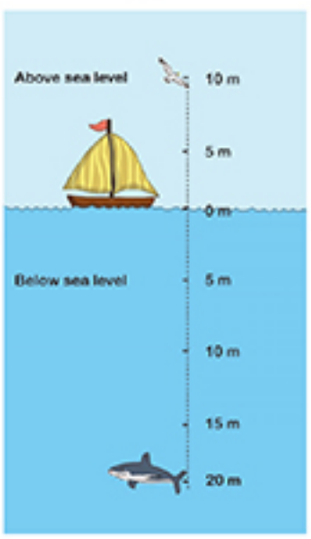


Example:
Question: Look at the number line. Which number is shown by the arrow?
Answer: –3

Language focus

A negative number is written with a minus sign in front, for example, –7.

Read this as 'negative seven'.



Sea level is 0 m. Negative numbers describe depths below sea level. Positive numbers give heights above sea level.

Think about it!

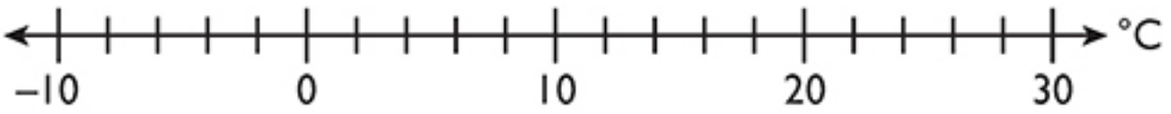
Look at the number line in the image above.

(a) What is the position of the seagull?

(b) What is the position of the shark?

Practise it!

1. Here is a temperature scale.



The temperature is 1° below freezing on a cold day.
Mark with an arrow (↑) the position of this temperature on the scale.

2. Here are some temperatures:

−4°C −2°C 1°C −8°C

(a) Which is the coldest temperature?

_____

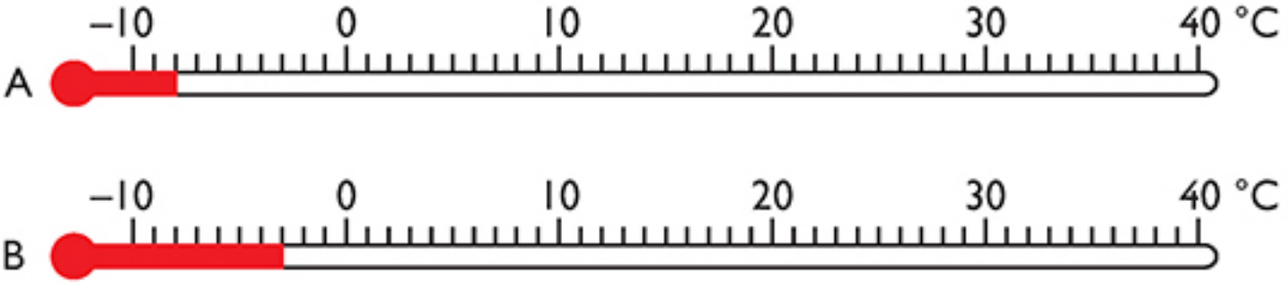
(b) Which is the warmest temperature?

_____

(c) Write the temperatures in order of size starting with the warmest.

_____

3. What temperature is shown on these thermometers?



(a) A is _____ °C.

(b) B is _____ °C.

Teachers' and parents' note

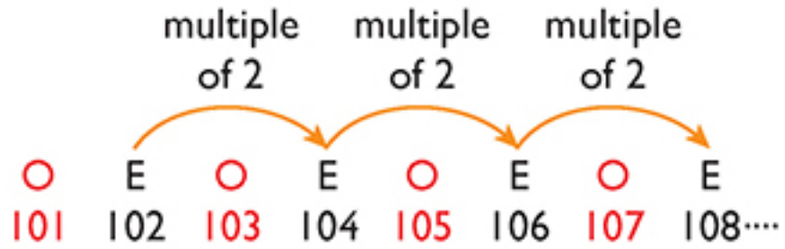
Provide opportunities for students to count on and back in steps of constant size from a given starting number, including passing through zero. Relate positive and negative numbers to contexts such as above and below ground level, temperature scales and weather charts.

Odd and even numbers

Read it!

Key words: even, odd, next, general statement, counter example

Even numbers are multiples of 2. They end in 0, 2, 4, 6 or 8.
Odd numbers have a remainder of 1 when they are divided by 2.



O stands for an odd number.
E stands for an even number.

Example: … 52, 54, 56, _____, _____, _____
Instruction: Write the **next** three even numbers.
Answer: 58, 60, 62

Language focus

Definition	Example
A **general statement** is a statement of a rule that is always true.	When I add two odd numbers, the answer is always even.
A **counter example** is an example that proves a general statement is wrong.	General statement: 'When I add an odd number and an even number, the answer is even.' This statement can be proved to be incorrect by this counter example: 3 + 4 = 7 This answer is odd.

We can use examples to illustrate a general statement such as 'the sum of two odd numbers is even'.

We can use O to stand for odd and E to stand for even and write this as O + O = E.

Example: 3 + 5 = 8 (3 and 5 are odd, 8 is even)

Think about it!

1. **Write an example to illustrate the general statement E + E = E.**

_____

2. **Write a counter example to show that this general statement E − O = E is false.**

_____