St Adrian's Catholic Primary School

'To learn, to love, to live as a community of God with Christ as our teacher'

Calculation Policy

Place Value

Main Principles

Follow this link for videos explaining the principles outlined below.

What is maths mastery?
Teaching maths for mastery is a transformational approach to maths teaching which stems from high performing Asian nations such as Singapore. When taught to master maths, children develop their mathematical fluency without resorting to rote learning and are able to solve non-routine maths problems without having to memorise procedures.

Concrete, pictorial, abstract (CPA)
Concrete, pictorial, abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths. Developed by American psychologist, Jerome Bruner, the CPA approach is essential to maths teaching in Singapore.

Number bonds
Number bonds are a way of showing how numbers can be combined or split up. They are used to reflect the 'part-part-whole' relationship of numbers.

Bar modelling
The bar model method is a strategy used by children to visualise mathematical concepts and solve problems. The method is a way to represent a situation in a word problem, usually using rectangles.

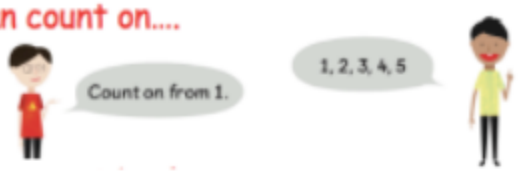
Fractions
In Singapore, the understanding of fractions is rooted in the Concrete, Pictorial, Abstract (CPA) model, where children use paper squares and strips to learn the link between the concrete and the abstract. At the heart of understanding fractions is the ability to understand that we're giving an equal part a name.

Place Value

Introduced in Year 1

Counting to 10:

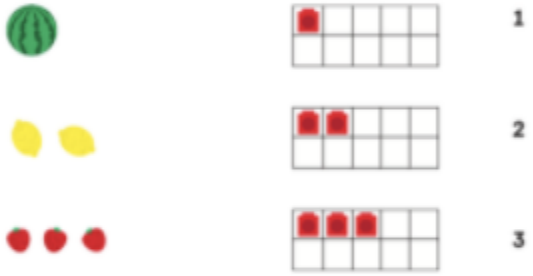
We can count on....



We can count back....

Then we learn about 0.

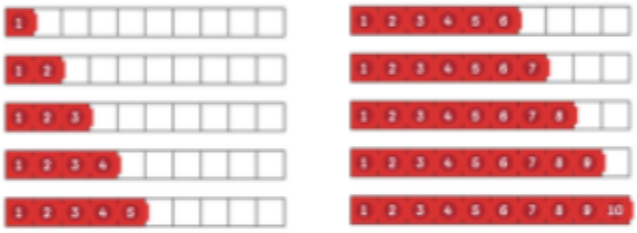
Counting with objects:



Physical objects

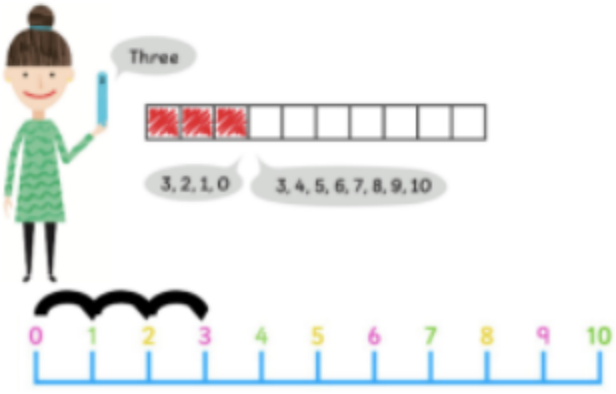
Tens squares

Counting with objects:

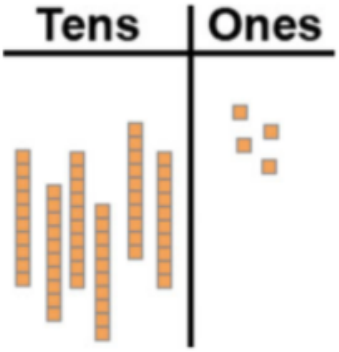


Using multilink cubes

Counting with number lines:



Dienes to represent numbers:



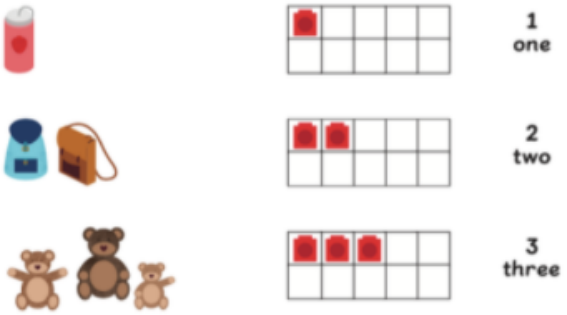
The dienes show **6 tens** and **4 ones**.

This shows the number **64**.

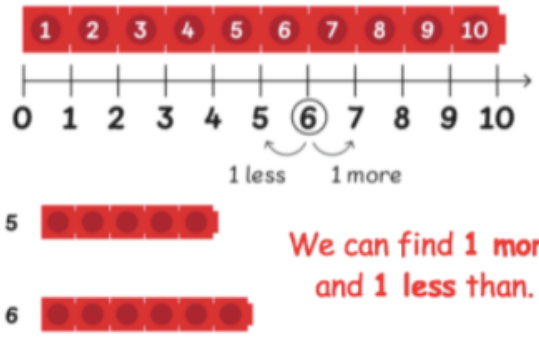
Number bond method:

Separating the numbers apart like this is called **partitioning.**

Writing numbers to 10:



Ordering numbers:



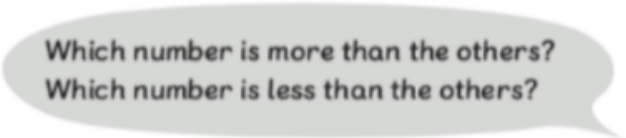
We can find **1 more** and **1 less** than.

Comparing numbers:

There are 3 cupcakes.

There are 5 cookies.

There are 7 doughnuts.



7 is more than 5.
7 is more than 3.
7 is the **greatest.**

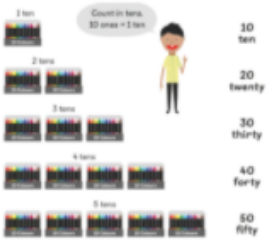
3 is less than 7.
3 is less than 5.
3 is the **smallest.**

1	2	**3**	4	**5**	6	**7**	8	9	10

Introduced in Year 2

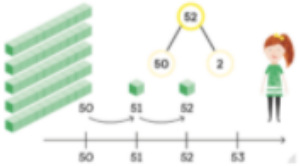
Counting in tens to 100:

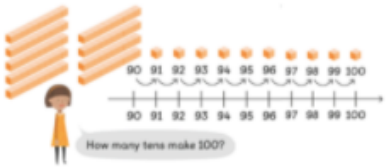
We can count on....



We can count back....

Counting in tens and ones:

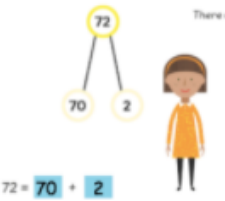


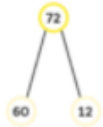


We can represent two-digit numbers in these ways:

tens	ones
6	5

We can make numbers using different number bonds:





Comparing numbers:

7 tens is more than 6 tens.
75 is more than 63.
75 is more than 69.
75 is the greatest.

3 ones is less than 9 ones.
63 is less than 69.
63 is the smallest.

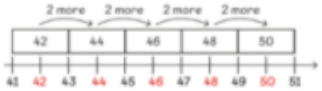
Using the < > signs

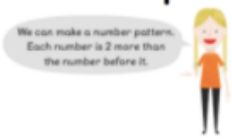
We can arrange the numbers in order:

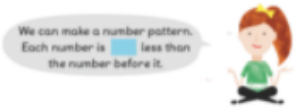
75, 69, 63 (greatest → smallest)

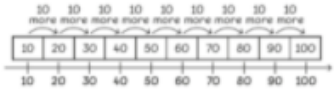
63, 69, 75 (smallest → greatest)

We can extend number patterns:

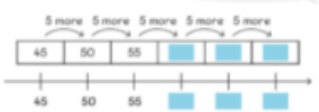


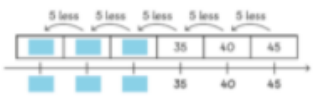


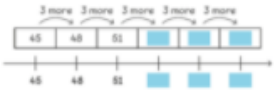


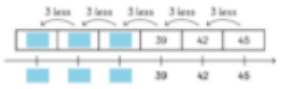


We can find the missing numbers in patterns:



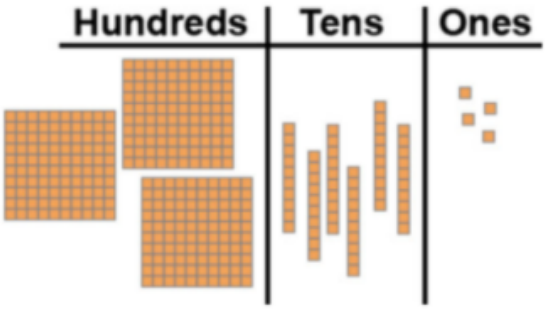






Introduced in Year 3

Base ten or dienes blocks:



Number bond method:

Value of digits:

hundreds	tens	ones
4	2	7

427 = 4 hundreds + 2 tens + 7 ones
427 = 400 + 20 + 7

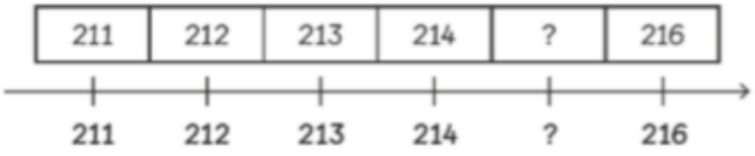
The digit 4 stands for 4 hundreds or 400.
The digit 2 stands for 2 tens or 20.
The digit 7 stands for 7 ones or 7.

We write 427 as four hundred and twenty-seven.

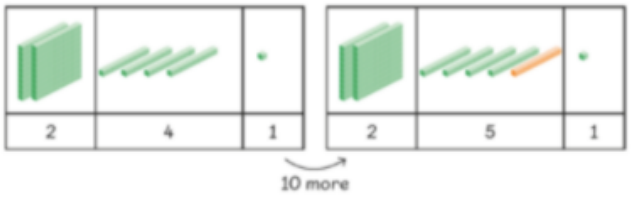
Place value cards:

Separating the numbers apart like this is called **partitioning**.

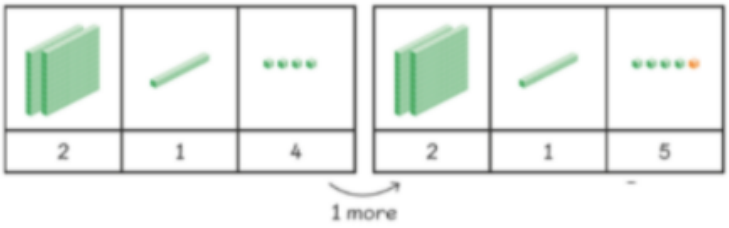
Number lines:



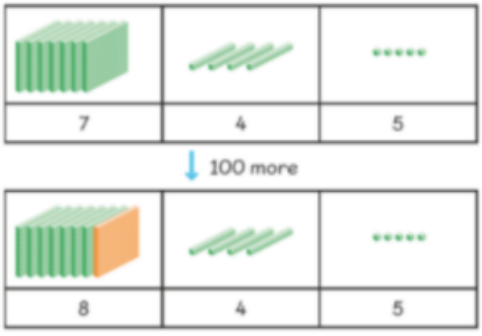
Finding 10 more or less than:



Finding 1 more or less than:



Finding 100 more or less:



Introduced in Year 4

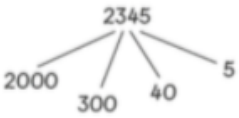
Base ten or dienes blocks:

Thousands/Hundreds/Tens/Ones

2 thousands + 3 hundreds + 4 tens + 5 ones

Partitioning:

2345 = 2000 + 300 + 40 + 5



We write 2345 as two thousand, three hundred and forty-five.

Value of digits:

2 thousands + 3 hundreds + 4 tens + 5 ones

thousands	hundreds	tens	ones
2	3	4	5

2345 = 2 thousands + 3 hundreds + 4 tens + 5 ones
2427 = 2000 + 300 + 40 + 5
The digit 2 stands for 2 thousand or 2000.
The digit 3 stands for 3 hundreds or 300.
The digit 4 stands for 4 tens or 40.
The digit 5 stands for 5 ones or 5.

We write 2345 as two thousand, three hundred and forty-five.

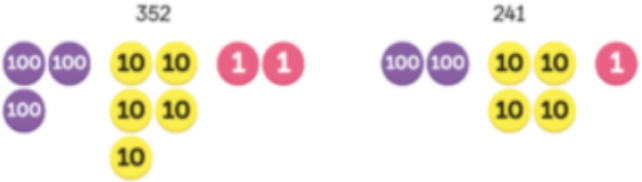
Place value cards:

Separating the numbers like this is called **partitioning.**

Place value counters:

7 thousands + 0 hundreds + 2 tens + 8 ones =7028

Comparing numbers:



352 is more than 241
352 is greater than 241
352 > 241

Number patterns:

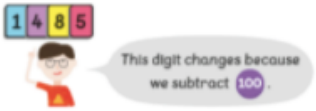
What number is 1 more than 1485?

1485 + 1 = 1486

What number is 10 more than 1485?

1485 + 10 = 1495

What number is 100 less than 1485?



1485 - 100 = 1395

Comparing numbers:

thousands	hundreds	tens	ones
2	5	0	0

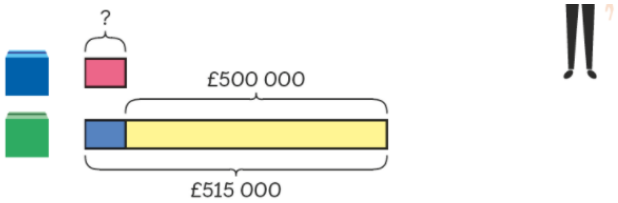
thousands	hundreds	tens	ones
5	8	0	0

2500 is less than 5800.
2500 < 5800

2500 is less than 5800
2500 < 5800

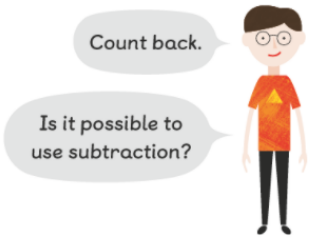
Introduced in Year 5

Comparing numbers to 1 000 000:

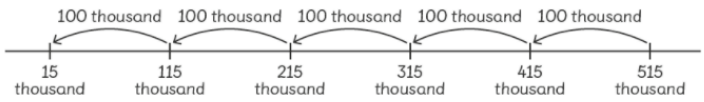


Method 1 Make a list.

515 000
415 000
315 000
215 000
115 000
15 000

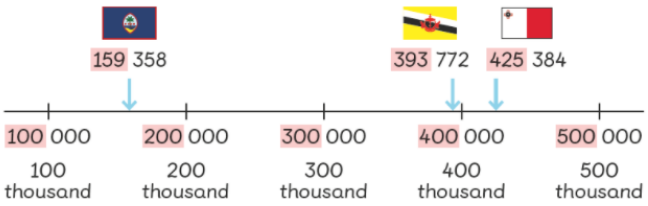


Method 2 Use a number line.

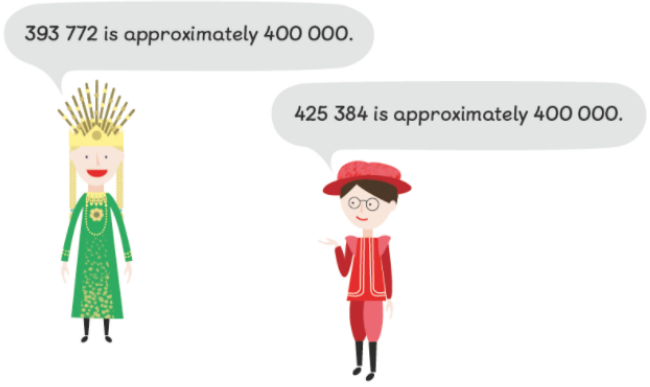


Rounding numbers to 1 000 000:

A website estimates the populations of Brunei, Malta and Guam as follows:



393 772 is closer to 400 000 than to 300 000.
425 384 is closer to 400 000 than to 500 000.



393 772 ≈ 400 000 (rounded to nearest 100 000)
425 384 ≈ 400 000 (rounded to nearest 100 000)