

[illegible]

YEAR 1

MAIN PRINCIPLES

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.

YEAR 1

PLACE VALUE – COUNTING

Counting to 10:

We can count on....



Count on from 1.

1, 2, 3, 4, 5



We can count back....



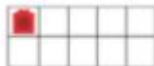
Count back from 10.

10, 9, 8, 7, 6, 5, 4

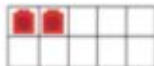


Then we learn about 0.

Counting with objects:



1



2

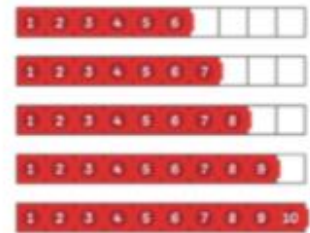
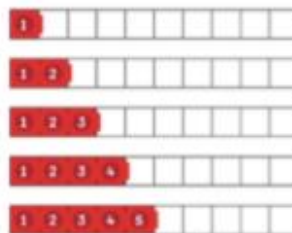


3

Physical objects

Tens squares

Counting with objects:



Counting with number lines:



Three



3, 2, 1, 0

3, 4, 5, 6, 7, 8, 9, 10

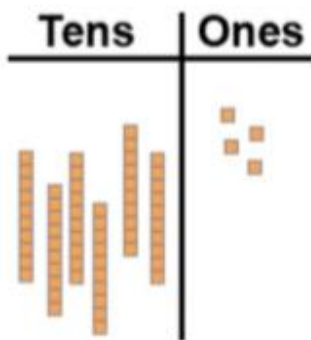
Using multilink cubes



YEAR 1

PLACE VALUE

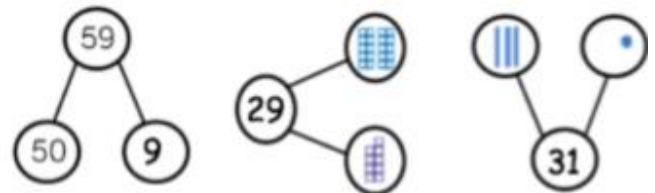
Dienes to represent numbers:



The dienes show
6 tens and 4 ones.

This shows the
number 64.

Number bond method:

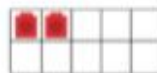


Separating the numbers apart like this is called
partitioning.

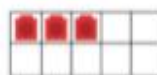
Writing numbers to 10:



1
one

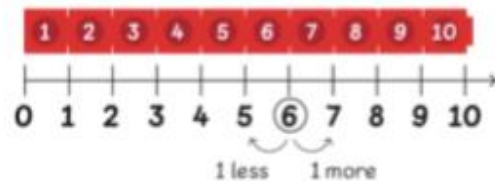


2
two



3
three

Ordering numbers:



5

6

We can find 1 more
and 1 less than.

Comparing numbers:

There are 3 cupcakes.



There are 5 cookies.



There are 7 doughnuts.



Which number is more than the others?
Which number is less than the others?



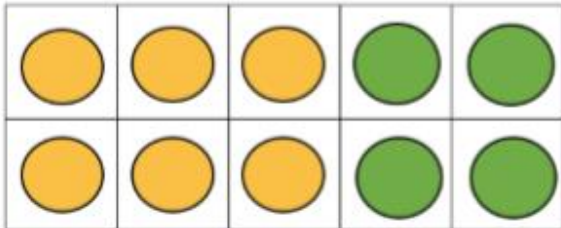
7 is more than 5.
7 is more than 3.
7 is the greatest.

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

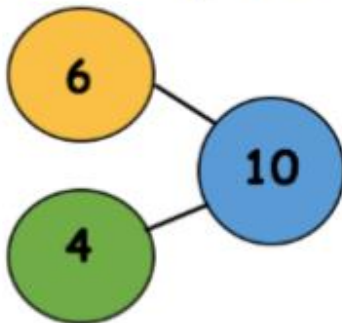
YEAR 1

ADDITION

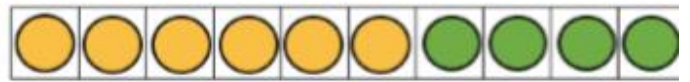
Tens frame:



Number bond method:



Tens strip:



Count on from the biggest number:

$$6 + 4 = 10$$

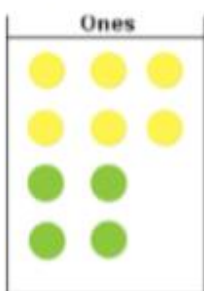
Number bond method:



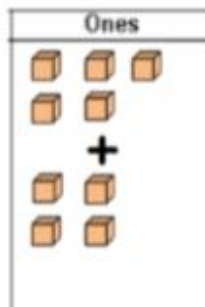
Picture method:



Counters method:



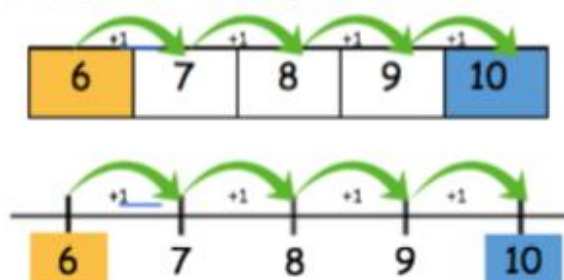
Base 10 method:



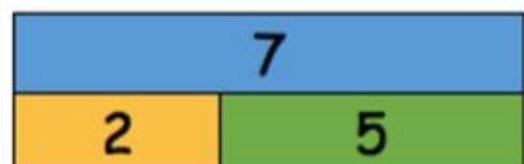
Abstract calculations:

Commutative	Inverse
$2 + 5 = 7$	$7 - 5 = 2$
$5 + 2 = 7$	$7 - 2 = 5$

Number line method:



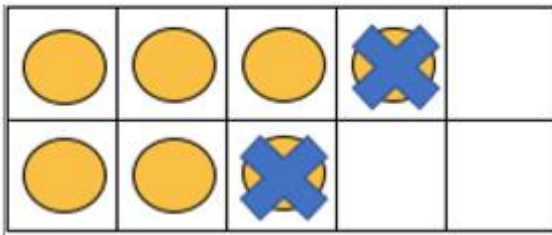
Bar model:



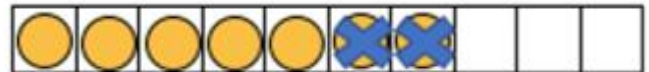
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SUBTRACTION

Tens frame:



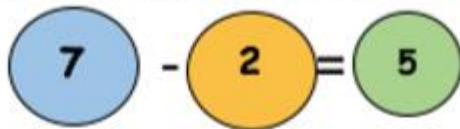
Tens strip:



Count back from the biggest number:

$$7 - 2 = 5$$

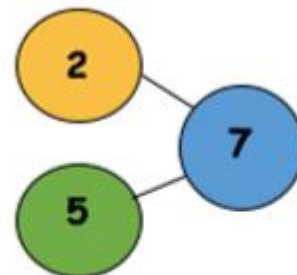
Number bond method:



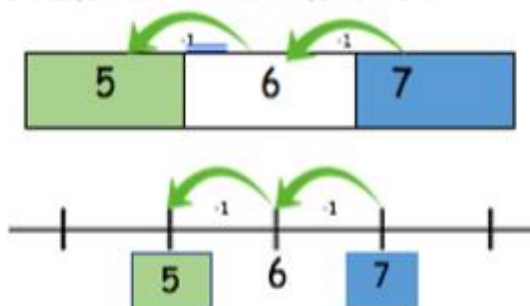
Picture method:



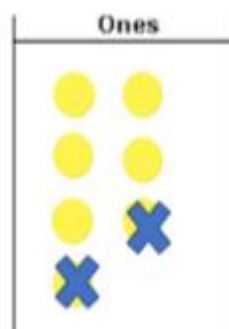
Number bond method:



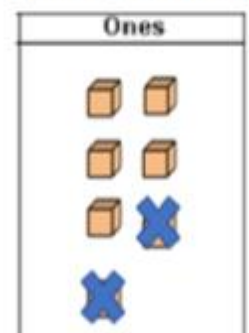
Number line method:



Counters method:



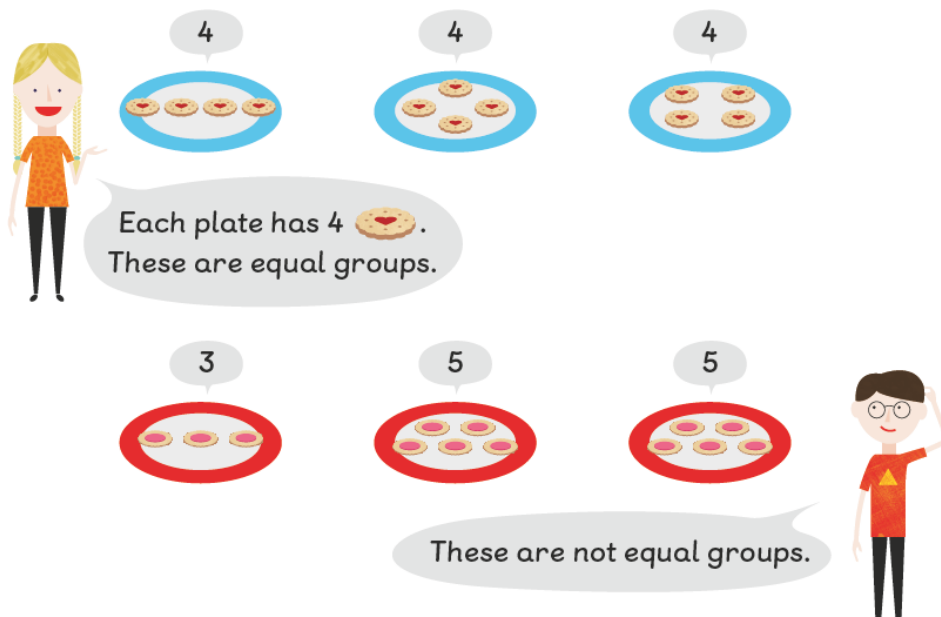
Base 10 method:



YEAR 1

MULTIPLICATION & DIVISION

Making equal groups



Adding equal groups



There are 4 trays.

4 trays of 5 = 20
4 groups of 5 = 20
4 fives = 20

There are 20  altogether.



Each tray has 5 .

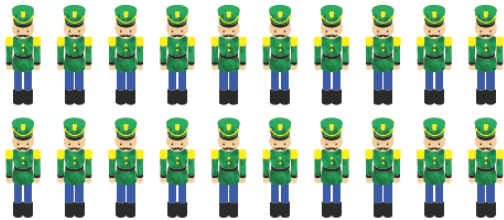
5, 10, 15, 20



YEAR 1

MULTIPLICATION & DIVISION

Making equal rows



10, 20

There are 10 toy soldiers in one row.

2 tens = 20

There are 20 toy soldiers altogether

Making doubles



Double 2 = 4



2 twos



Double 5 = 10

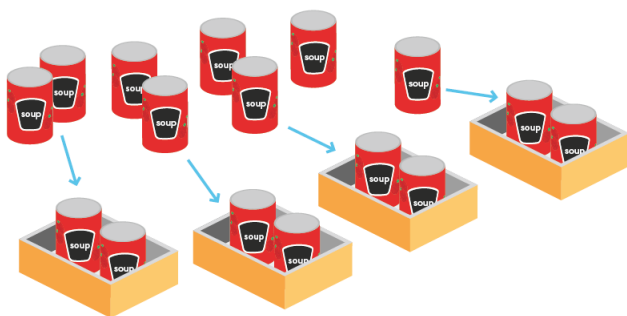


2 fives

DIVISION

Grouping equally

There are 8 cans.



There are 4 boxes of 2 cans.

Sharing equally

Each child takes one cookie.



Each child takes one more cookie.



No cookies are left.

Each child gets 2 cookies.

