St Matthew's C of E Primary School

YEAR 4 CALCULATION POLICY

YEAR 4
MAIN PRINCIPLES

Scan QR codes to be directed to the MNP website with further information and videos.

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 4
PLACE VALUE

Base ten or dienes blocks:

Thousands/Hundreds/Tens/Ones

2 thousands + 3 hundreds + 4 tens + 5 ones

Value of digits:

2 thousands + 3 hundreds + 4 tens + 5 ones

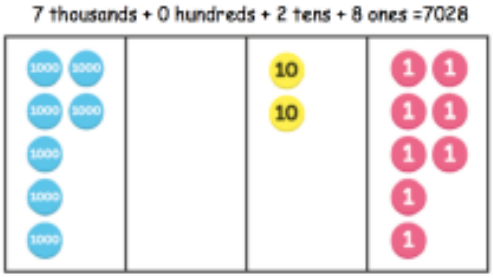
thousands	hundreds	tens	ones
2	3	4	5

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 counters:

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



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

Partitioning:

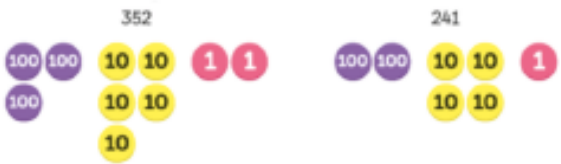
2345 = 2000 + 300 + 40 + 5

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

Place value cards:

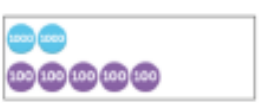
Separating the numbers like this is called **partitioning.**

Comparing numbers:



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

Comparing numbers:



thousands	hundreds	tens	ones
2	5	0	0

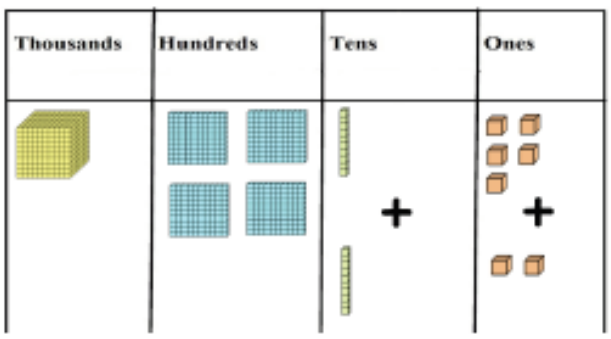
thousands	hundreds	tens	ones
5	8	0	0

2500 is less than 5800.
2500 < 5800

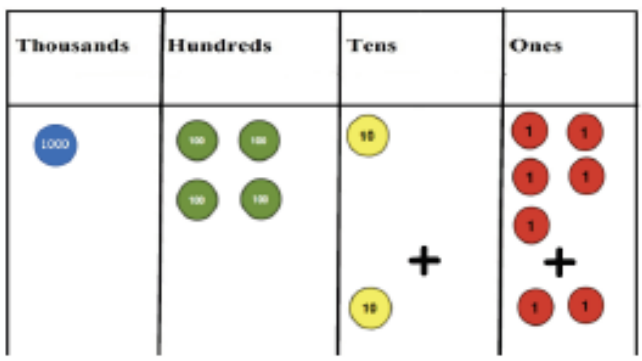
2500 is less than 5800
2500 < 5800

YEAR 4
ADDITION

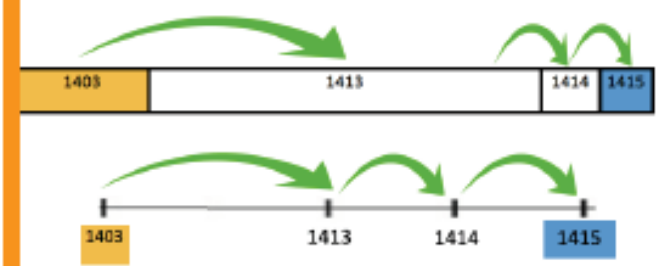
Base 10 method:



Counters method:



Number line method:

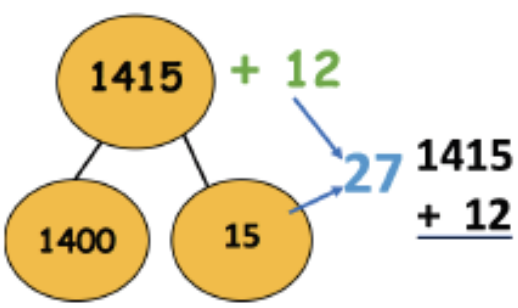


Abstract calculations:

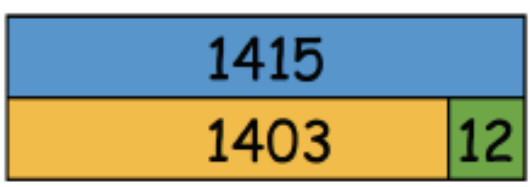
Commutative	Inverse
1415 + 12 = 1427	1427 - 12 = 1415
12 + 1415 = 1427	1427 - 1415 = 12

Number bond method:

Number bond method:



Bar model:



Column addition:

Without renaming:

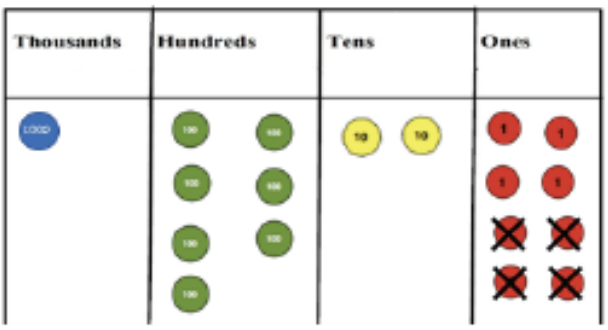
$$\begin{array}{r} 1\,4\,1\,5 \\ +\quad\;\; 1\,2 \\ \hline 1\,4\,2\,7 \end{array}$$

With renaming:

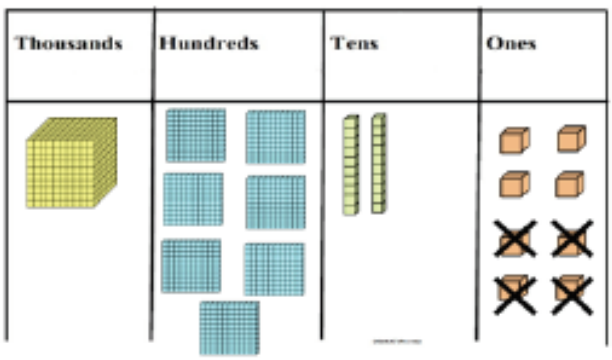
$$\begin{array}{r} {\scriptstyle 1\;\;1} \\ 1\,4\,1\,5 \\ +\quad\;\; 9\,6 \\ \hline 1\,5\,1\,1 \end{array}$$

YEAR 4
SUBTRACTION

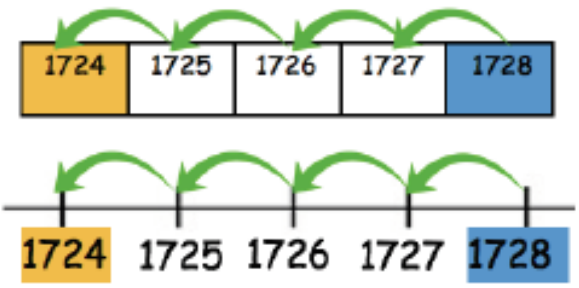
Counters method:



Base 10 method:



Number line method:

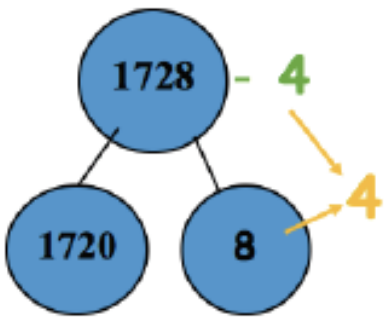


Abstract calculations:

Commutative	Inverse
1728 - 4 = 1724	1724 + 4 = 1728
1728 - 1724 = 4	4 + 1724 = 1728

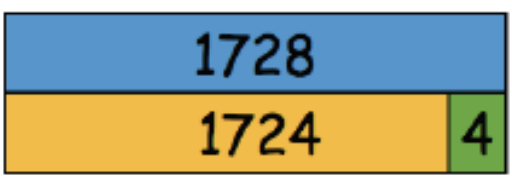
Number bond method:

Number bond method:



1720
+ 4
1724

Bar model:



Column subtraction:

Without renaming:

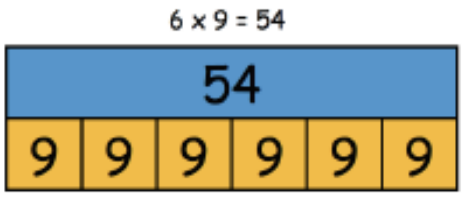
1 7 2 8
- 4
1 7 2 4

With renaming:

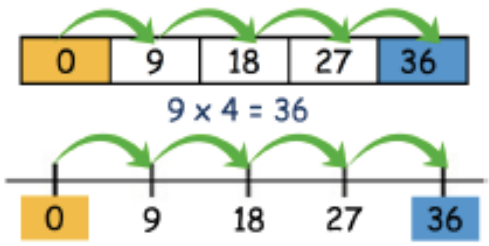
6 11 18
1 7 2 8
- 3 4 9
3 7 9

YEAR 4
MULTIPLICATION

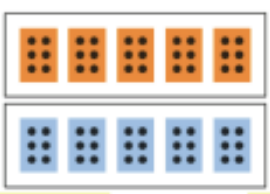
Bar model:



Number line method:



Multiply 3 numbers:

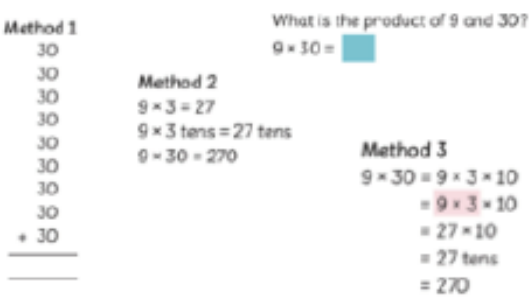


2 x 5 x 6 = 10 x 6 = 60

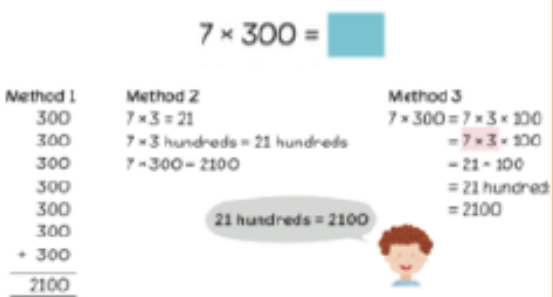
Array method:

6 x 3 = 18 OR 3 x 6 = 18

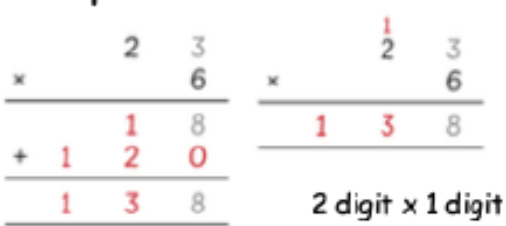
Multiplying by 10:



Multiplying by 100:

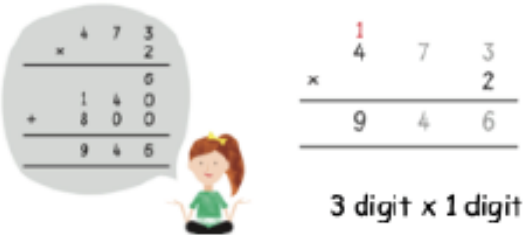


Bridged and short multiplication:



2 digit x 1 digit

Bridged and short multiplication:

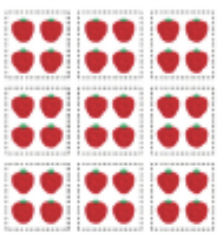


3 digit x 1 digit

YEAR 4
DIVISION

Division by grouping:

Placing into 9 equal groups



36 ÷ 9 = 4

Each group has 4 strawberries.

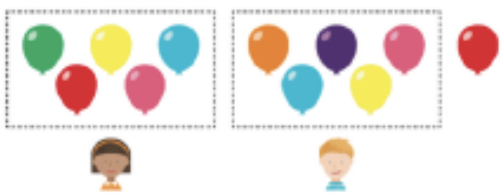
Placing in groups of 9

36 ÷ 9 = 4

There are 4 groups.

Grouping with remainders:

There were 11 balloons.



11 ÷ 2 = 5 remainder 1

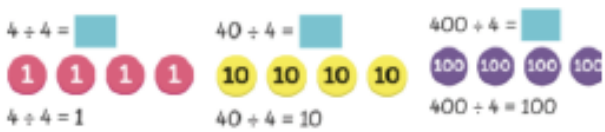
The quotient is 5 and the remainder is 1.
Each friend got 5 balloons.
There was 1 balloon left over.

Divide using multiplication:

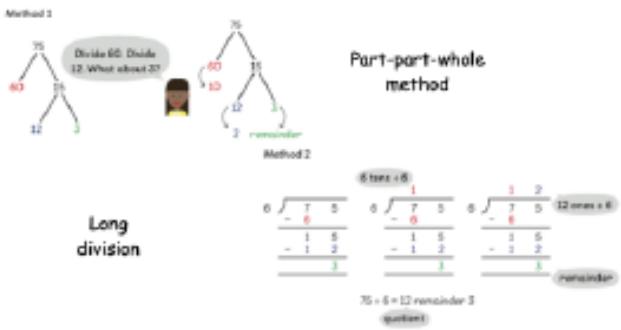
24 ÷ 3 = 8

3 x 8 = 24

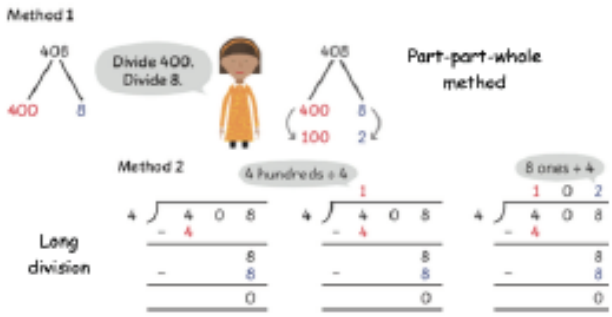
Dividing by 1, 10 and 100:



Divide with remainders:

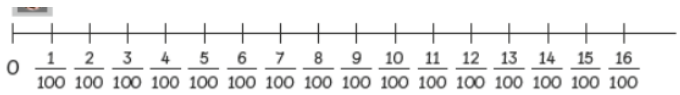


Divide without remainders:

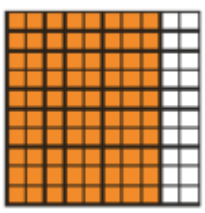


YEAR 4

FRACTIONS

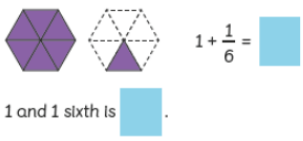


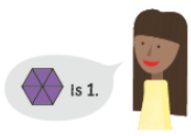
Number lines



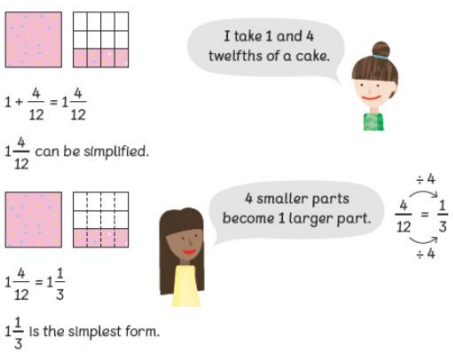
Hundred Squares

Mixed Number Fractions



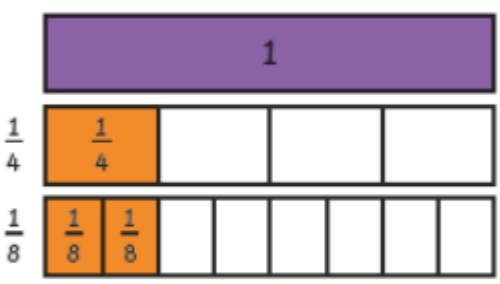


Simplifying Fractions

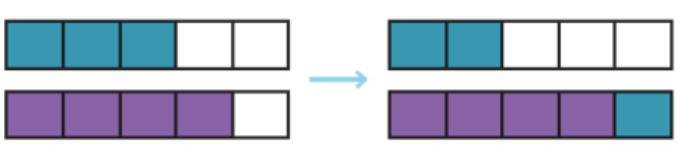


Equivalent Fractions

Is $\frac{1}{4} = \frac{2}{8} = \frac{3}{4}$?



$\frac{1}{4} = \frac{2}{8}$



$\frac{3}{5}$ and $\frac{4}{5}$ make 1 and $\frac{2}{5}$. $1\frac{2}{5}$

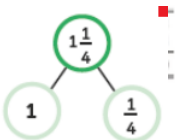
Subtracting Fractions

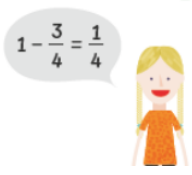
$1 - \frac{3}{4} = \frac{1}{4}$

$1\frac{1}{4} - \frac{3}{4} = \frac{1}{4} + \frac{1}{4} = \frac{2}{4}$

$1\frac{1}{4} - \frac{3}{4} = \frac{1}{2}$

There is $\frac{1}{2}$ kg of flour left in the sack.



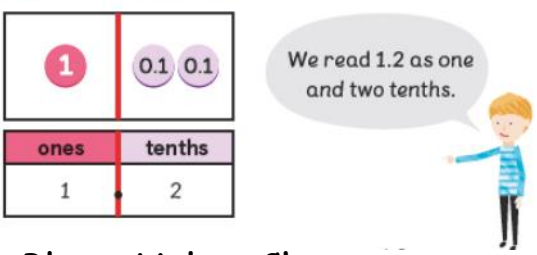


Adding Fractions

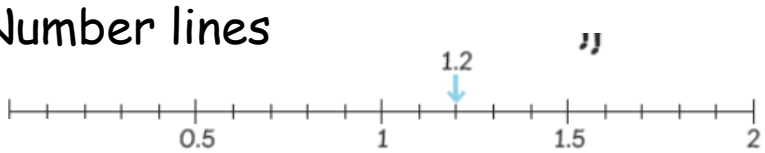
YEAR 4

DECIMALS

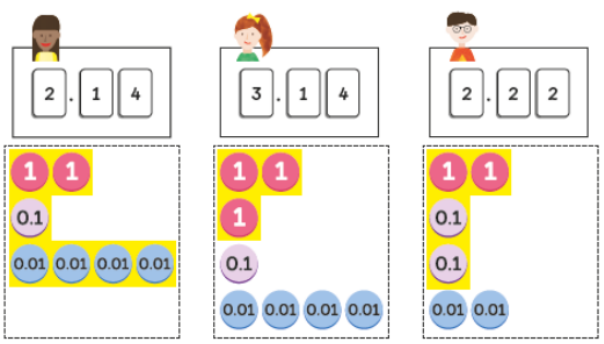
Place Value Counters



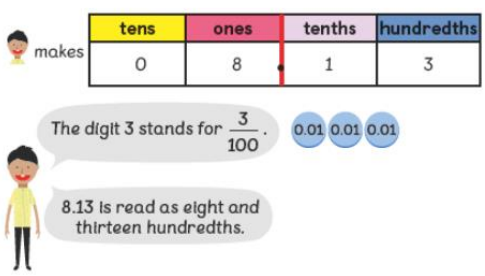
Number lines



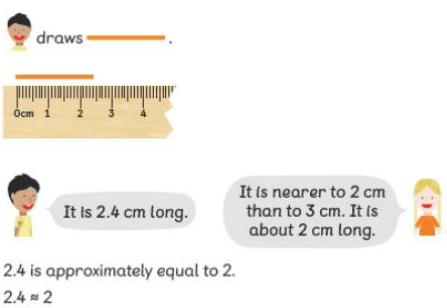
Compare and Order Decimals



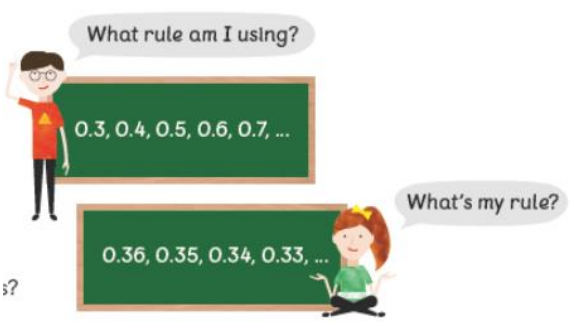
Place Value Charts



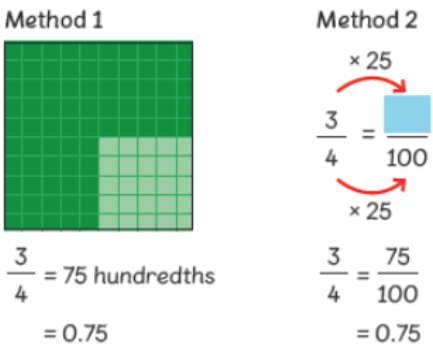
Rounding Decimals



Number Patterns/ Sequences



Writing fractions as Decimals



Dividing whole numbers by 10 and 100