# St Matthew's C of E Primary School

# YEAR 2 CALCULATION POLICY

# YEAR 2
# 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 2
# PLACE VALUE

## Counting in tens to 100:

We can count on....

We can count back....

## Counting in tens and ones:

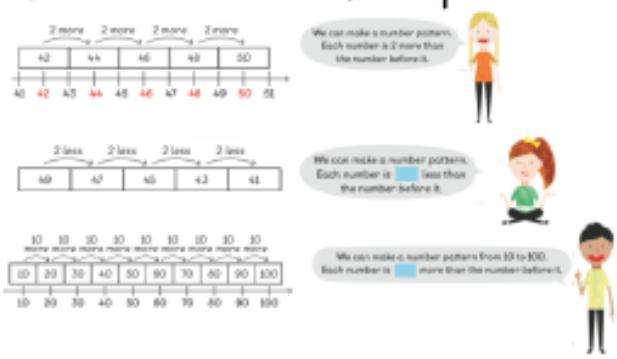
## We can represent two-digit numbers in these ways:

| tens | ones |
|---|---|
| 6 | 5 |

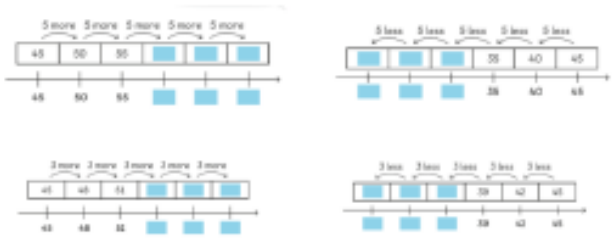
## We can make numbers using different number bonds:

## Comparing numbers:

## We can extend number patterns:

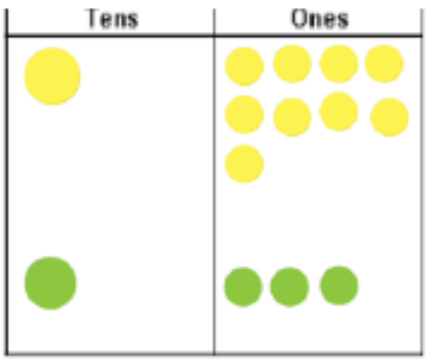


## We can find the missing numbers in patterns:

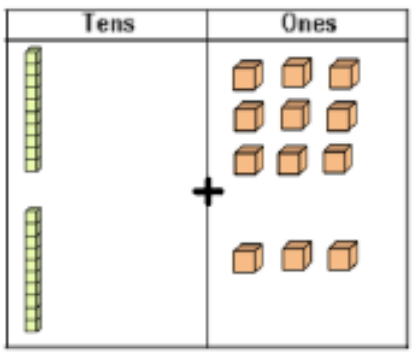


# YEAR 2
# ADDITION

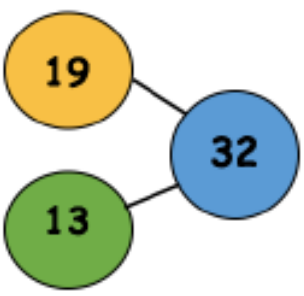
## Counters method:



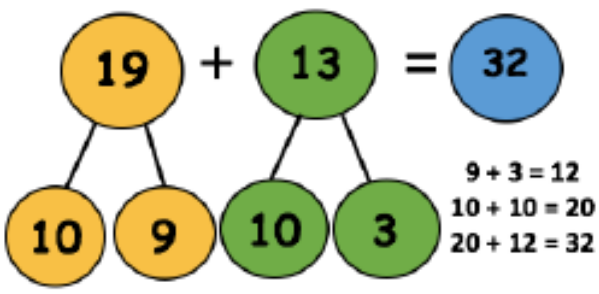

## Base 10 method:



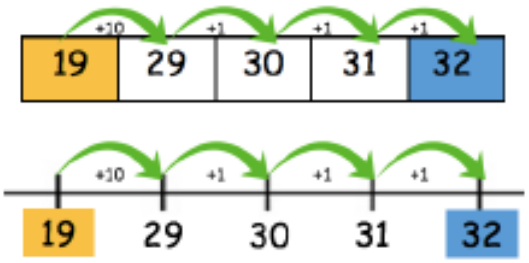

## Number bond method:



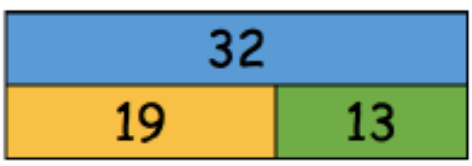

## Number bond method:




## Number line method:




## Bar model:




## Column addition:

Without renaming:

$$\begin{array}{r} 18 \\ +\ 11 \\ \hline 29 \end{array}$$

With renaming:

$$\begin{array}{r} 19 \\ +\ 13 \\ \hline 32 \\ {\scriptstyle 1} \end{array}$$

Expanded method:

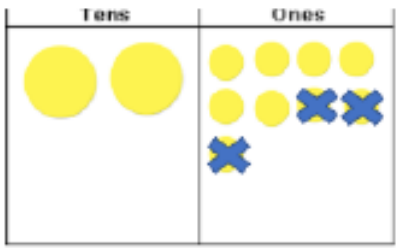
$$\begin{array}{r} 19 \\ +13 \\ \hline 12 \\ 20 \\ \hline 32 \end{array}$$

## Abstract calculations:

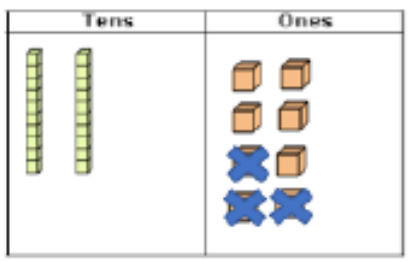
| Commutative | Inverse |
|---|---|
| 19 + 13 = 32 | 32 – 13 = 19 |
| 13 + 19 = 32 | 32 – 19 = 13 |

# YEAR 2
# SUBTRACTION

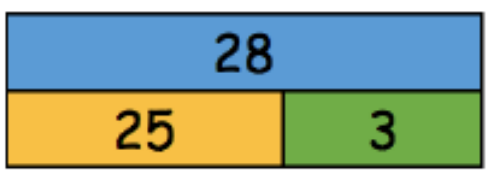
## Counters method:



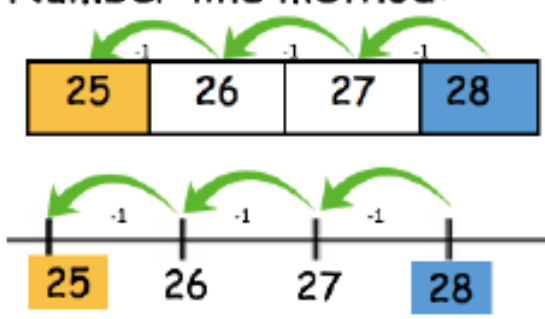

## Base 10 method:



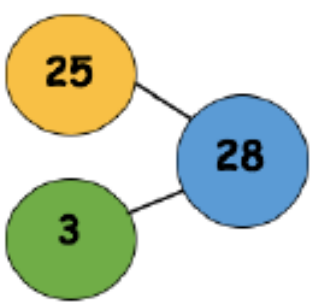

## Bar model:



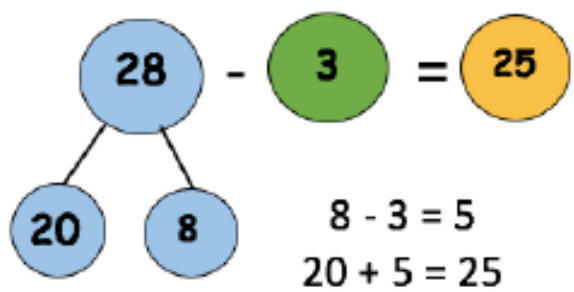

## Number line method:




## Number bond method:




## Number bond method:




8 - 3 = 5

20 + 5 = 25

## Column subtraction:

Without renaming:

$$\begin{array}{r} 28 \\ -\ 3 \\ \hline 25 \end{array}$$

With renaming:

$$\begin{array}{r} {}^{1}\not{2}\,{}^{13}\not{3} \\ -\ 19 \\ \hline 4 \end{array}$$

Expanded method:

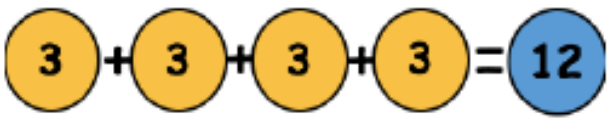
$$\begin{array}{r} 29 \\ -14 \\ \hline 5 \\ \ \ 10 \\ \hline 15 \end{array}$$

## Abstract calculations:

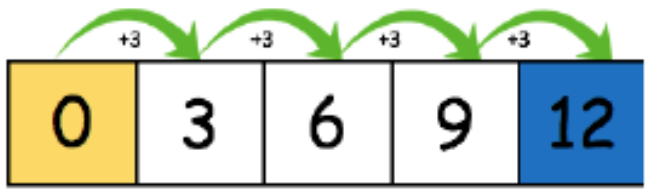
| Commutative | Inverse |
|---|---|
| 25 + 3 = 28 | 28 - 3 = 25 |
| 3 + 25 = 28 | 28 - 25 = 3 |

# YEAR 2
# MULTIPLICATION

Repeated addition:



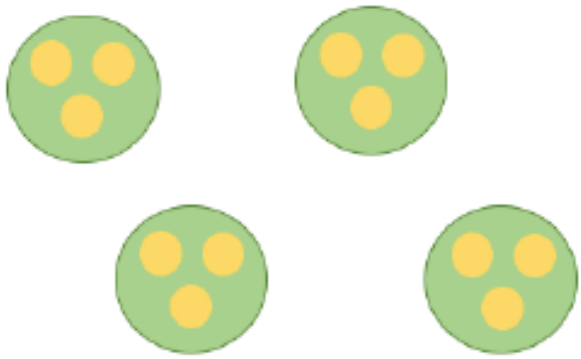

Number line method:




Groups of:


Multiplication:


Grouping Method:



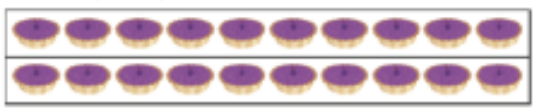
Abstract calculations:

| Commutative |
| --- |
| 3 x 4 = 12 |
| 4 x 3 = 12 |

# YEAR 2
# DIVISION

## Make a family of multiplication and division facts:

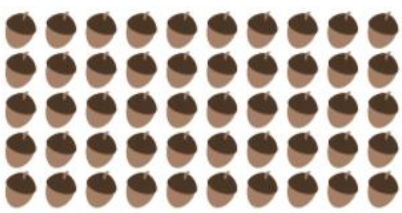
Look at the picture.
Make a family of multiplication and division facts.



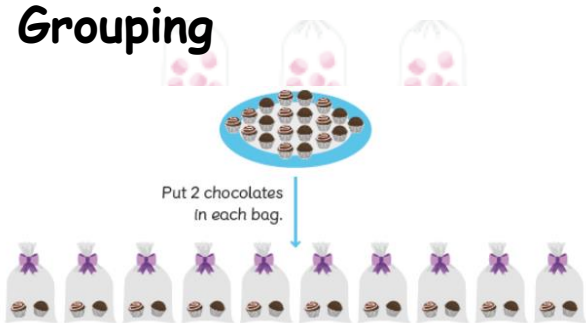
2 × 10 = 20 ——— 20 ÷ 2 = 10

10 × 2 = 20 ——— 20 ÷ 10 = 2

## Arrays



## Grouping




## Solving Problems

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag.
How many bags does Ruby need?

Method 1 Use  to stand for .

Use  for each bag.

## Solving Problems:

Ruby has 15 marshmallows.
She packs 5 marshmallows into each bag.
How many bags does Ruby need?

Method 3 Use a division equation.

15 ÷ 5 = 3

Ruby needs 3 bags.

## Bar Method

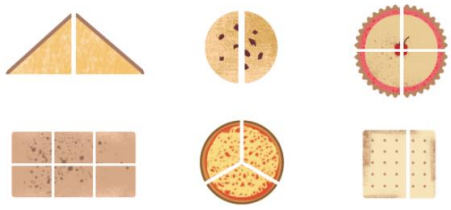
| 20 | | | | |
|---|---|---|---|---|
| 4 | 4 | 4 | 4 | 4 |

## Repeated Subtraction

20 - 4 - 4 - 4 - 4 - 4 = 0

# YEAR 2
# FRACTIONS

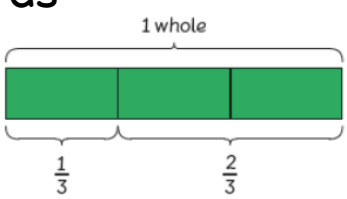
## Equal Parts



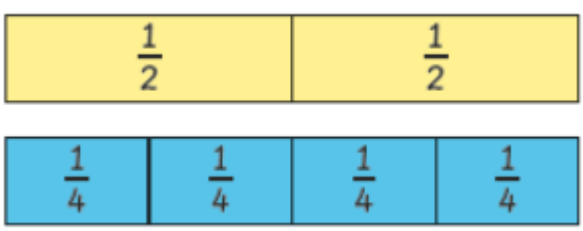
## Using different models to show fractions of shape

Show $\frac{3}{4}$ of a rectangle.

## How many parts make a whole – halves, quarters, thirds




$\frac{1}{3}$ and $\frac{2}{3}$ make 1 whole.




## Compare and order fractions

Compare $\frac{1}{2}$ and $\frac{1}{3}$.

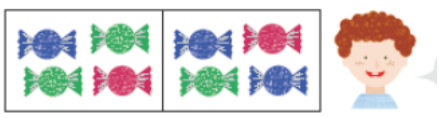
Which is less?

Which is more?


## Find fractions of a quantity

Half a box is 3 pieces of chocolate.

What is $\frac{1}{2}$ of 8 sweets?



What is $\frac{1}{2}$ of 4?

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