

Maths at Hillstone

Aim

Our aim is to equip all pupils with the skills and confidence to solve a range of problems through fluency with numbers and mathematical reasoning. Children are encouraged to see the mathematics that surrounds them every day and enjoy developing vital life skills in this subject.

Carefully planned activities encourage children to work mentally, observe patterns, make predictions and discuss relationships. Mathematics skills are also used in other subjects such as science, computing and art.

Mastering Maths at Hillstone

At Hillstone Primary, we have adopted a mastery approach in order to deliver the three aims of the National Curriculum, fluency, reasoning and problem solving. Underpinning this pedagogy is a belief that all children can achieve in maths. We believe in promoting a sustained and deep understanding by employing a variety of mastery strategies, with teaching for conceptual understanding at the heart of everything we do. We aim to create independent mathematicians who are well equipped to apply their learning to the wider world. Our approach aims to provide all children with full access to the curriculum, enabling them to develop independence, confidence and competence – ‘mastery’ in mathematics in order to be independent mathematicians who are well equipped to apply their learning to the wider world.

The mathematical journey that children undertake at Hillstone Primary aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Key features of our curriculum include:

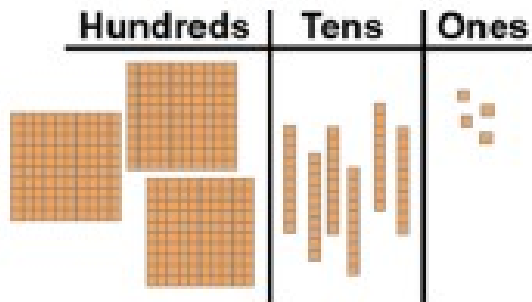
- High expectations for every child
- Greater depth of topics
- Real life number sense and place value
- Application of skills learn to solve problem
- Calculating with confidence– understand why it works

We place emphasis on the cumulative mastery of essential knowledge and skills in mathematics. It embeds a deeper understanding of maths by utilising a concrete, pictorial, abstract approach so that pupils understand what they are doing rather than just learning to repeat routines without grasping what is happening.

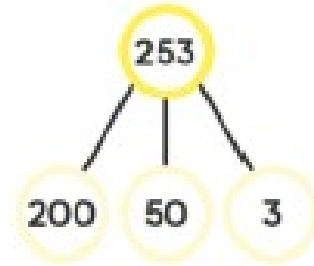
YEAR 3

PLACE VALUE

Base ten or dienes blocks:



Number bond method:



Value of digits:

hundreds	tens	ones
4	2	7

$427 = 4 \text{ hundreds} + 2 \text{ tens} + 7 \text{ ones}$

$427 = 400 + 20 + 7$

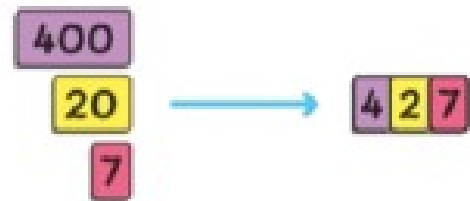
The digit **4** stands for **4 hundreds** or **400**.

The digit **2** stands for **2 tens** or **20**.

The digit **7** stands for **7 ones** or **7**.

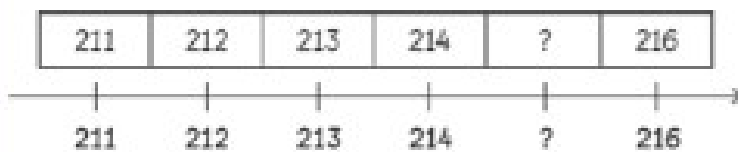
We write **427** as **four hundred and twenty-seven**.

Place value cards:

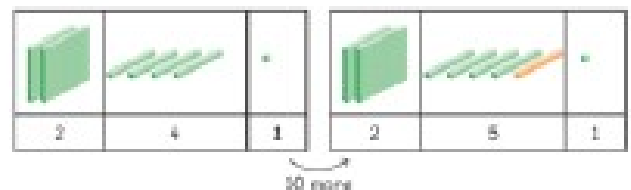


Separating the numbers apart like this is called **partitioning**.

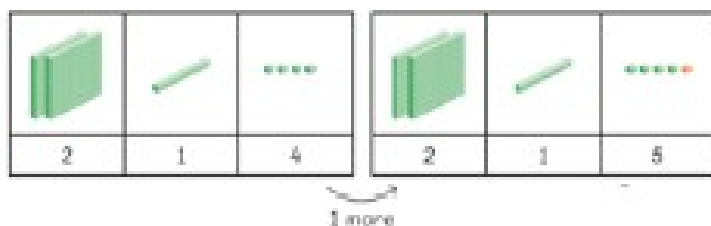
Number lines:



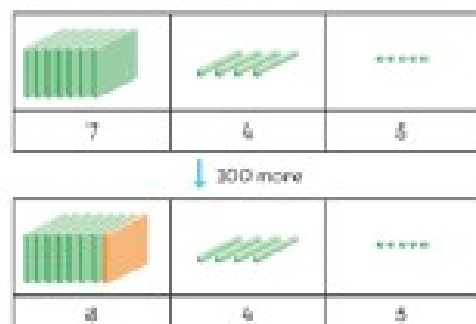
Finding 10 more or less than:



Finding 1 more or less than:



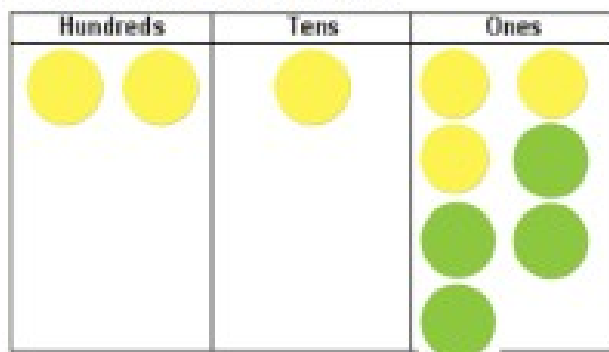
Finding 100 more or less:



YEAR 3

ADDITION

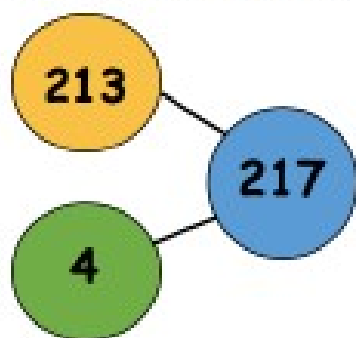
Counters method:



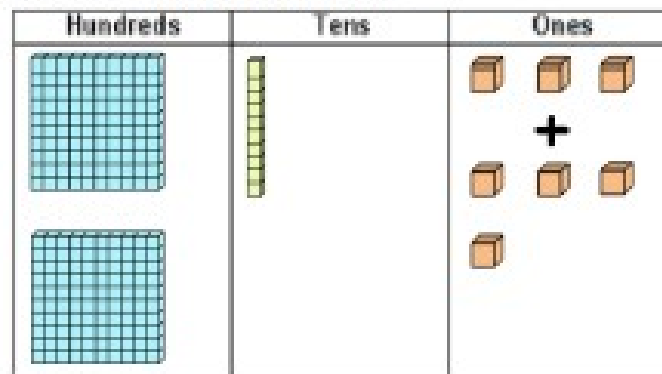
Number line method:



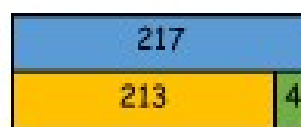
Number bond method:



Base 10 method:



Bar model:



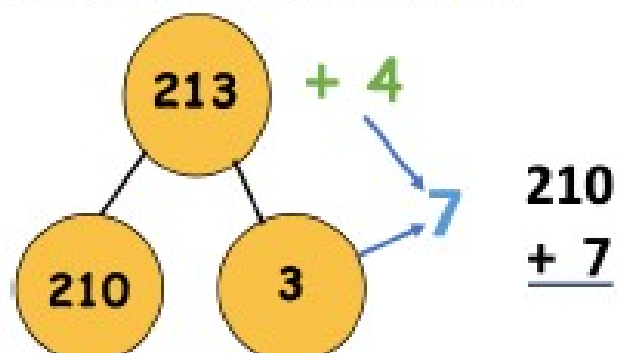
How many pencils do they have altogether?



$$15 + 23 = 38$$

They have 38 pencils altogether.

Number bond method:



Abstract calculations:

Commutative	Inverse
$213 + 4 = 217$	$217 - 4 = 213$
$4 + 213 = 217$	$217 - 213 = 4$

Column addition:

Without renaming:

$$\begin{array}{r} 213 \\ + \quad 4 \\ \hline 217 \end{array}$$

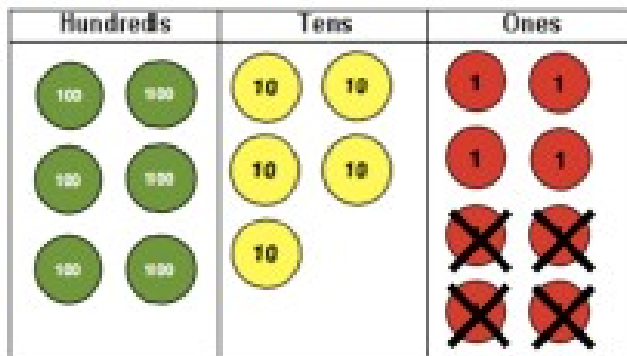
With renaming:

$$\begin{array}{r} 1 \quad 1 \\ 213 \\ + 497 \\ \hline 710 \end{array}$$

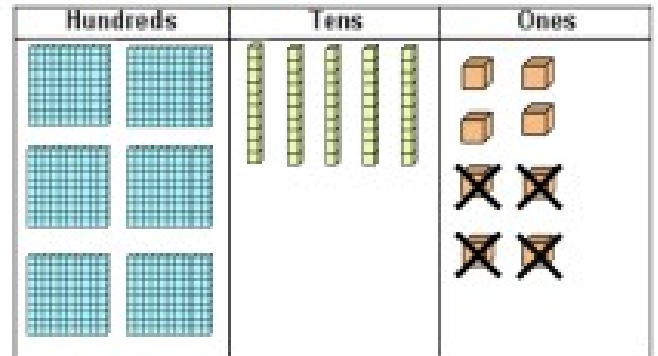
YEAR 3

SUBTRACTION

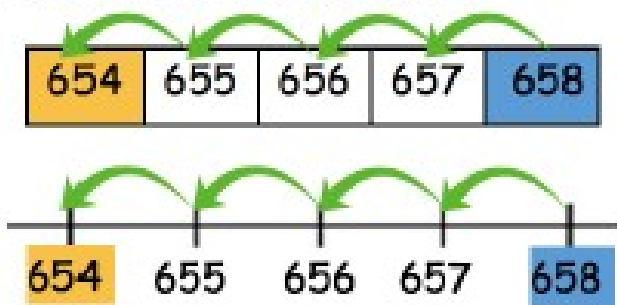
Counters method:



Base 10 method:



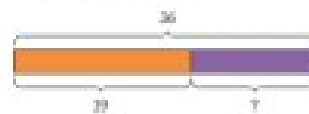
Number line method:



Bar models:

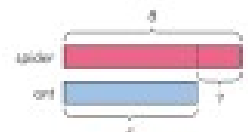
Bar model:

There are 30 children in the school band.
20 of them are boys.
How many girls are there?



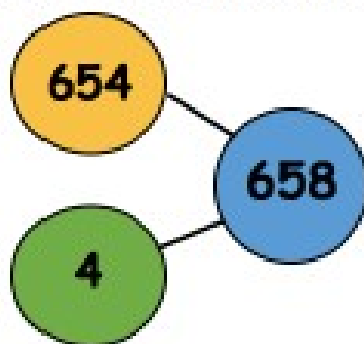
Comparative model:

A spider has 8 legs.
An ant has 6 legs.

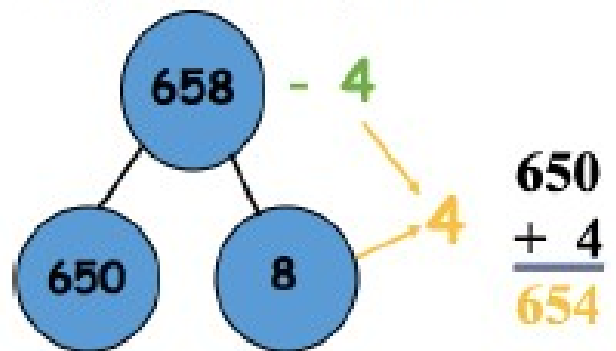


$8 - 6 = 2$
A spider has 2 more legs than an ant.

Number bond method:



Number bond method:



Abstract calculations:

Commutative	Inverse
$658 - 4 = 654$	$654 + 4 = 658$
$658 - 654 = 4$	$4 + 654 = 658$

Column subtraction:

Without renaming:

$$\begin{array}{r} 658 \\ - \quad 4 \\ \hline 654 \end{array}$$

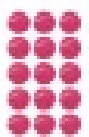
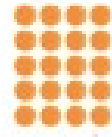
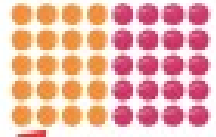
With renaming:

$$\begin{array}{r} 6\overset{4}{\cancel{5}}\overset{1}{8} \\ - 349 \\ \hline 309 \end{array}$$

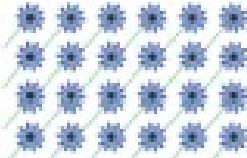
YEAR 3

MULTIPLICATION

Arrays:


3 times tables	4 times tables	8 times tables
		
$3 \times 5 = 15$	$4 \times 5 = 20$	$8 \times 5 = 40$ <small>(doubling the 4 times tables)</small>

Make a family of multiplication and division facts:



$6 \times 4 = 24$	$24 \div 6 = 4$
$4 \times 6 = 24$	$24 \div 4 = 6$

Number bond strategy: Multiplication

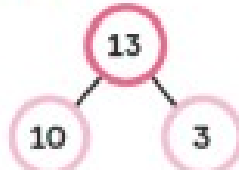


$12 \times 4 = 48$

$10 \times 4 = 40$ $2 \times 4 = 8$
 $40 + 8 = 48$

Bridged column method: Without renaming

$13 \times 3 = 39$



	t	o
	1	3
\times		3
		9
	+	30
		39

Bridged column method: With renaming

Multiply the ones by 4.

	t	o
	2	5
\times		4
		0

5 ones $\times 4 = 20$ ones
20 ones = 2 tens

Multiply the tens by 4.

	t	o
	2	5
\times		4
	2	0
	8	0

2 tens $\times 4 = 8$ tens


Add the products.

	h	t	o
		2	5
\times			4
		2	0
		8	0
	1	0	0


20 + 80 = 100

Short multiplication: Without renaming

$2 \times 4 = 8$



$2 \times 40 = 80$



	t	o
	2	0
\times		4
		0

Short multiplication: With renaming

Multiply the ones by 4.

	t	o
	2	7
\times		4
		8

7 ones $\times 4 = 28$ ones
28 ones = 2 tens + 8 ones

Multiply the tens by 4.

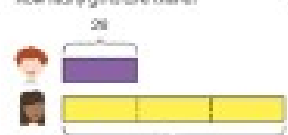
	h	t	o
		2	7
\times			4
	1	8	8

4 tens $\times 4 = 16$ tens
16 tens + 2 tens = 18 tens

Solving word problems: Bar model

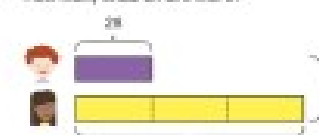
There are 28 boys in a group. There are 3 times as many girls as there are boys.

(a) How many girls are there?



$28 \times 3 = 84$
There are 84 girls.

(b) How many children are there?



$28 + 84 = 112$
There are 112 children altogether.

YEAR 3

DIVISION

Grouping: 'groups of'

Put 8 🍪 into groups of 4.



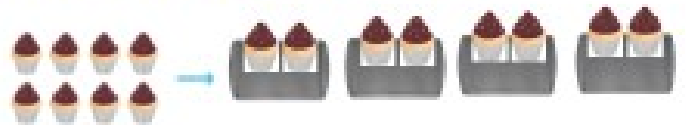
$$8 \div 4 = 2$$

2 plates are needed.

"I have made groups of 4. There are 2 equal groups. There are 4 in each group. 2 equal groups of 4 equals 8."

Grouping: 'equal groups'

Put 8 🍪 into 4 equal groups.



$$8 \div 2 = 4$$

4 trays are needed.

"There are 4 equal groups. There are 2 in each group. 4 equal groups of 2 equals 8."

Number bond strategy: Division

6 tens \div 2 = 3 tens

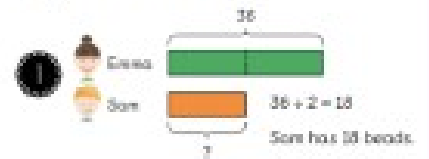
$$68 \div 2 = 34$$

8 ones \div 2 = 4 ones

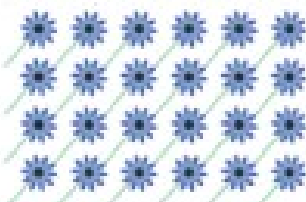


Solving word problems: Bar model

How many beads do the children have altogether?



Make a family of multiplication and division facts:



$$6 \times 4 = 24 \quad \text{---} \quad 24 \div 6 = 4$$

$$4 \times 6 = 24 \quad \text{---} \quad 24 \div 4 = 6$$

Number bond and long division:

