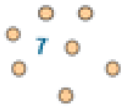
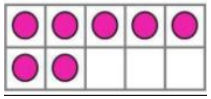
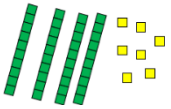
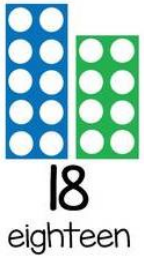
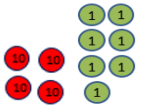
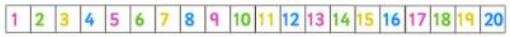
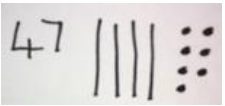
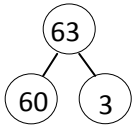
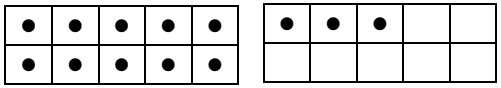
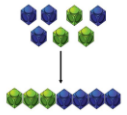
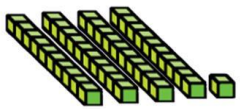
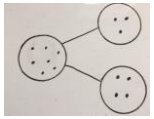
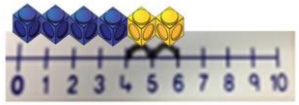
Year 1

Concrete	Pictorial	Abstract
Place Value - Count, read and write numbers to 100		
 Tens frames  7 Base 10  47 Numicon  Place value counters  47 Bead string  23	Number line  Draw base 10  Bar Model 15 10 | 5 Part Whole  Draw tens frames  13	Write 2-digit numbers in figures and words: *'Write 15 in words.'* *'Show 13 in tens and ones on a tens frame.'* **<u>Vocabulary</u>:** **Tens, ones, 1-digit, 2-digit number**
Add and subtract 1 and 2-digit numbers up to 20		
Combine 2 parts to make a whole: Multilink/counters  3 + 4 = 7 Base 10   Tens frames	**Combine 2 parts to make a whole:** Part whole  7 = 4 + 3 4 + 3 = 7 Bar model (count on) 6 4 | | | 6 = 4 + □ **Count on using a number line**	**Combine 2 parts to make a whole:** Calculations, using +, -, = including missing numbers, should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'. 3 + 4 = □ □ = 3 + 4 3 + □ = 7 7 = □ + 4 13 - 4 = □ □ = 13 - 4 13 - □ = 7 7 = □ - 6 First, then and now as a sequence of

5 + 4 = 9

Count on using numicon & objects:

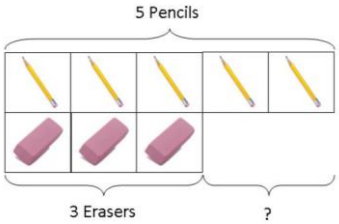


Objects – e.g. shells, stones, conkers etc

Bead string

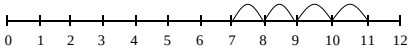
8 + 5 = 13

Bar Model

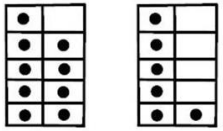


5 = 3 + □

7 + 4 = 11



Draw Tens frames



9 + 6

understanding,
e.g. First there were 4 frogs, then 3 frogs more came, now there are….

Vocabulary:

Addition – add, more, total, sum

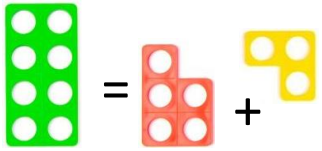
Number bonds up to and within 10 and derive facts to 20

Multilink/counters

5 + 4 = 9
9 – 4 =?

? + 4 = 9
9 - ? = 5

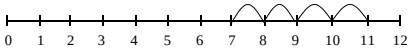
Numicon



Objects – e.g. shells, stones, conkers, tractors etc

Number line:

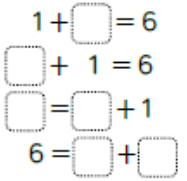
7 + 4 = 11



100 square:

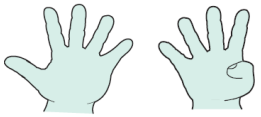
10 + 8 = 18

Record as a number sentence using + and – including missing numbers:



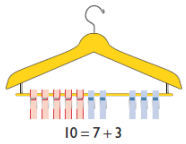
8 + ? = 10 ? + 8 = 10
10 – 8 = ? 10 - ? = 8

Fingers:



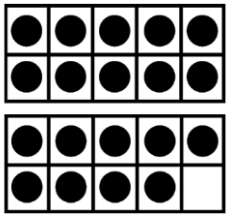
9 + ? = 10 ? + 9 = 10
10 – 9 = ? 10 - ? = 9

Bead string:

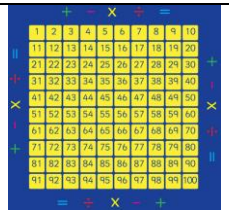


7 + ? = 10 ? + 7 = 10
10 – 7 = ? 10 - ? = 7

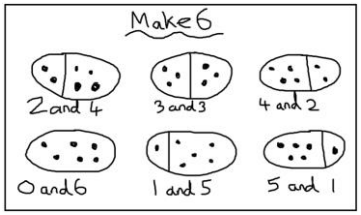
Tens frames:



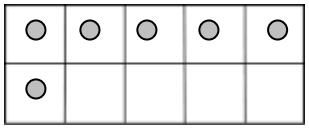
10 + 9 = 19



Number bond jottings:



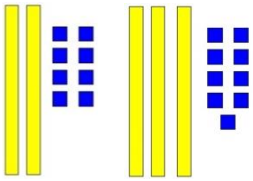
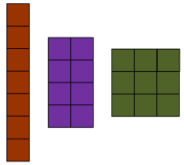
Draw Tens frames:



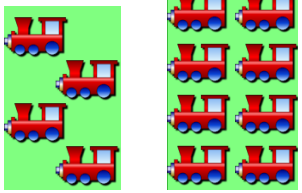
5 + 1 = 6

<u>Vocabulary</u>:
Addition – add, more, total, sum

Regrouping to make 10

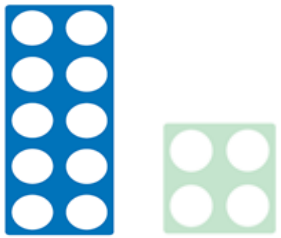
Concrete	Pictorial	Abstract
Compare numbers (within 100)		
Base 10  Multilink/counters 	Number line  6 < 10, 9 > 4 Base 10 with <, > or =	Greater than and less than signs: 23 > ☐ ☐ < 10

Compare Objects – e.g. shells, stones, conkers, tractors etc
Which is more/less?

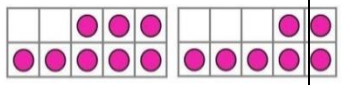


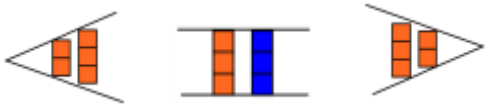
Cuisinaire

Numicon

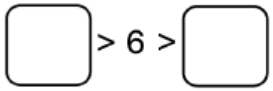


Tens frames



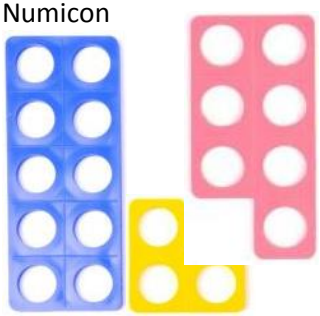
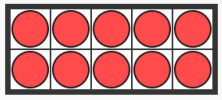
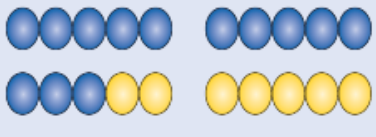
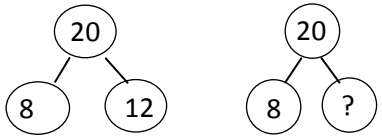
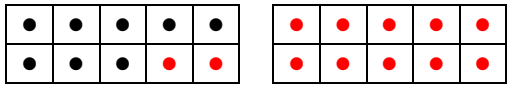
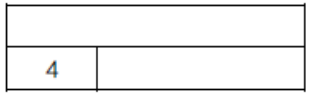
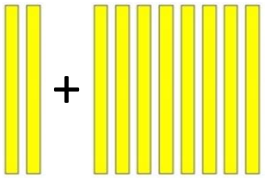
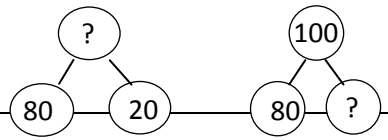


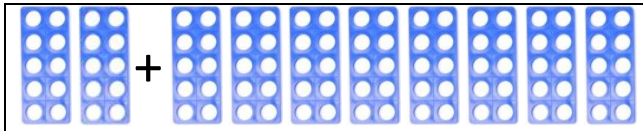
Draw images in the boxes to make the statement true:



<u>Vocabulary:</u>
Greater than, more than, less than, equal to, smallest number, largest number

Year 2

Concrete	Pictorial	Abstract
Use rapid recall of number facts up to and within 20		
Numicon  10 = 3 + 7 Tens frames:  Bead string:  13 + 7 =	Bar Model 20 / 2 | 18 20 / 2 | ? Part whole  Tens frames: 	Recording as number sentences using +, -, = including missing numbers 13 + 7 = 20 □ = 13 + 7 20 - □ = 7 20 = □ + 17 Problems such as: Here is an incomplete bar model. The total is greater than 10 but less than 20 What could the numbers be? How many different combination scan you find?  **Vocabulary:** **Addition – add, more, total, sum, groups of, plus, increase, altogether.**
Derive and use related number facts to 100		
Base 10  20 + 80 = Numicon	Bar Model: ? / 20 | 80 100 / 20 | ? Part whole 	Calculations: 8 + 2 = 10 18 + 2 = 20 8+ 12 = 20 98 + 2 = 100 8 + 92 = 100 Systematic working including missing numbers If: 3 + 4 = 7 □ = 13 + 7



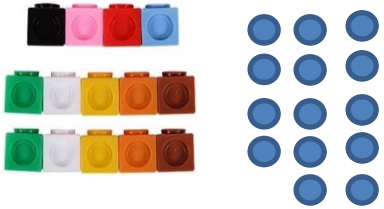
30 + □ = 70 40 = □ + 7

Vocabulary:
Addition – add, more, total, sum, groups of, plus, increase, altogether.

Add numbers: a 2-digit number and ones, a 2-digit number and tens, 2 2-digit numbers, 3 1-digit numbers

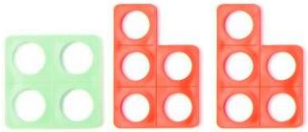
Adding 3 1-digit numbers

Multilink/counters/objects



4 + 5 + 5 =

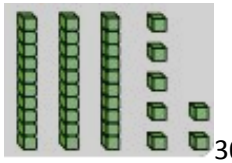
Numicon



4 + 5 + 5 =

Counting on in tens and ones

Base 10



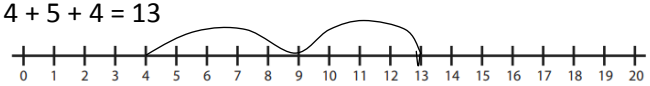
30 + 7 = 37 *('31, 32, 33, 34, 35, 36, 37')*

Tens frames with counters

Adding 3 1-digit numbers

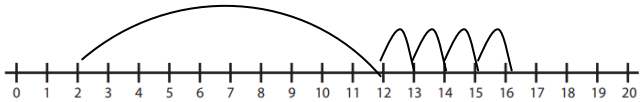
Number line:

4 + 5 + 4 = 13



Counting on in tens and ones

Number line – count on in tens then ones:



2 + 14 = 2 + 10 = 12; 12 + 4 = 16

Adding 3 1-digit numbers

Record as addition number sentence:

8 + 5 + 3 = 16

include missing numbers:

□ + 4 + 5 = 15 7 + 4 + □ = 14

Vocabulary:
Addition – add, more, total, sum, groups of, plus, increase, altogether, missing numbers, greater/less than.

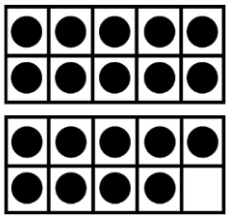
Counting on in tens and ones

23 + 12 =

23 + 10 + 2 = 33 + 2 = 35

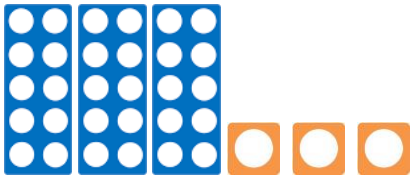
Including missing numbers:

32 + □ = 45



10 + 9 = 19 *(‘10, 11, 12, 13, 14, 15, 16, 17, 18, 19’)*

Numicon:

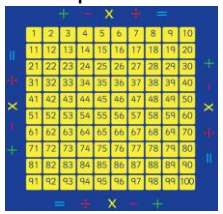


3 tens + 3 ones = 33

10p/1p coins:

2 tens + 3 ones = 23

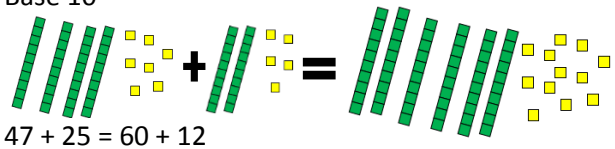
100 square:



16 + 12 =

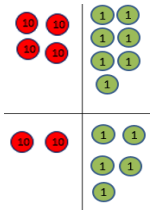
Partitioning and recombining

Base 10



47 + 25 = 60 + 12

Place value counters:



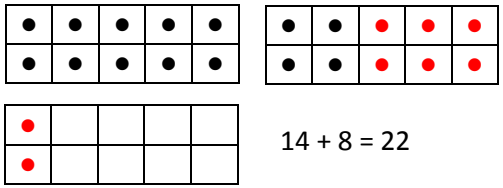
47 + 25 = 72

Coins:

34 + 23 = 57

Partitioning and bridging through 10

Tens frame with counters

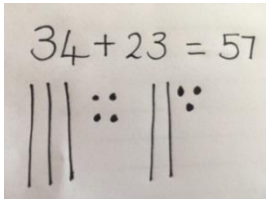


14 + 8 = 22

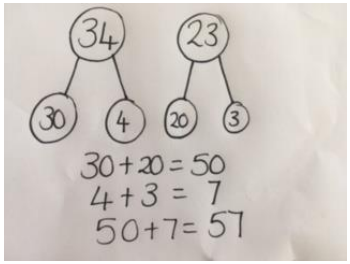
Bead string

Partitioning and recombining

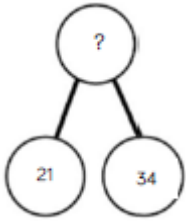
Draw base 10:



Part whole model:



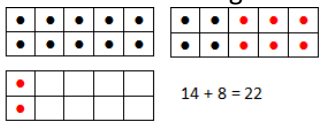
Include missing numbers:



Missing digit problems:

Partitioning and bridging through 10

Tens Frame drawing



14 + 8 = 22

Partitioning and recombining

Expanded written method:

30 + 4

20 + 3

50 + 7 = 57

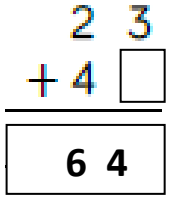
Compact method:

3 4

+ 2 3

5 7

Include missing numbers:

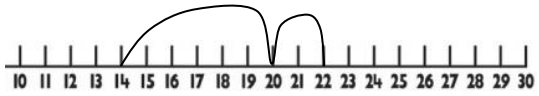


Partitioning and bridging through 10

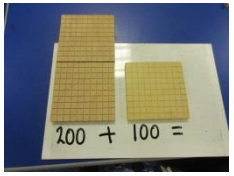
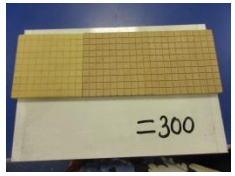
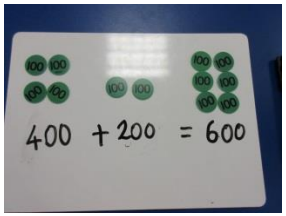
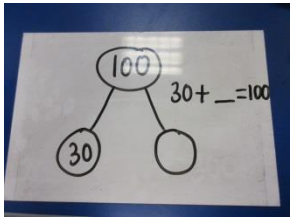
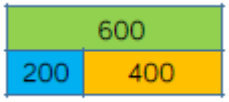
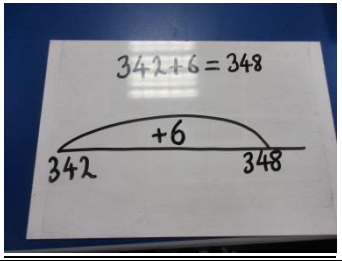
18 + 5 =

18 + 2 + 3 =23

(Including missing numbers)

	Number line +6 +2  Bridge through 20 14 + 8 = 22	
Other things which need to be explicitly taught: Show addition can be done in any order but subtraction cannot.		

Year 3

Concrete	Pictorial	Abstract
Mentally add - 3-digit number and ones, a 3-digit number and tens, a 3-digit number and hundreds		
<u>Add & Subtract multiples of 100</u> Base 10   Place value counters 	<u>Add & Subtract multiples of 100</u> Part whole  Bar model  100 60 | ? 60 + ? = 100	<u>Add & Subtract multiples of 100</u> 400 + 500 = 900 Include missing numbers 30 + ____ = 100 ____ + 100 = 200 400 + 200 = _____
<u>Adding 3-Digit Numbers And Ones</u> Base 10  Place value counters	<u>Adding 3-Digit Numbers And Ones</u> Number line 	<u>Adding 3-Digit Numbers And Ones</u> 340 + 8 = 348 342 + 6 = 348 Include missing numbers & working systematically

<table>
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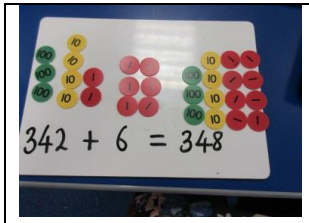
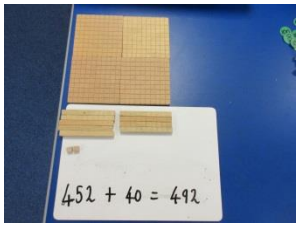
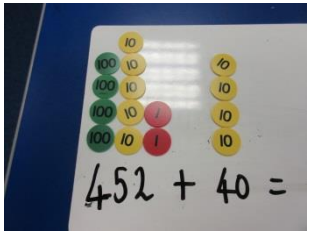
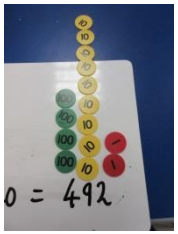
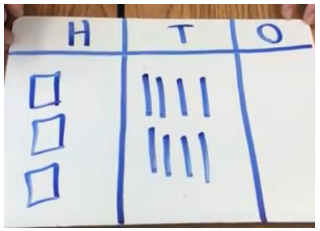
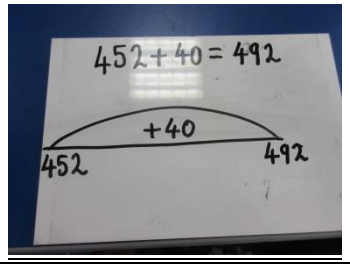
<td> 
</td>
<td></td>
<td></td>
</tr>
<tr>
<td><u>Adding 3-Digit Numbers And Tens</u>
Base 10
 

Place value counters
 

 
</td>
<td><u>Adding 3-Digit Numbers And Tens</u>
Base 10:
300 + 80 + 0 = 380
 

Number line:
452 + 40 = 492
 
</td>
<td><u>Adding 3-Digit Numbers And Tens</u>
452 + 40 = 492
Include missing numbers & working systematically

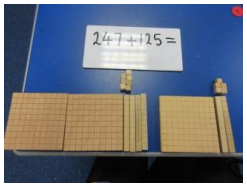
336 + 80
453 + 60
347 + 70
285 + 80

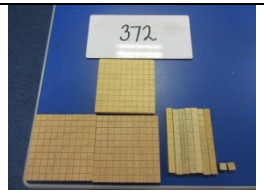
Write a sensible number story to represent this bar model.

<table>
<tr><td colspan="2">324</td></tr>
<tr><td>254</td><td></td></tr>
</table></td>
</tr>
<tr>
<td><u>Adding 3-Digit Numbers, Tens and Ones – Towards a written method (with decom</u>

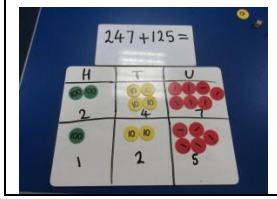
Base 10</td>
<td><u>Adding 3-Digit Numbers, Tens and Ones – Towards a written method</u>
Draw place value counters
<table>
<tr><th>H</th><th>T</th><th>O</th></tr>
<tr><td>● ●</td><td>● ●
● ●</td><td>● ● ●
● ● ●</td></tr>
</table></td>
<td><u>Adding 3-Digit Numbers, Tens and Ones – Towards a written method</u>
Expanded method:
200 + 40 + 7
<u>100 + 20 + 5</u>
<u>300 + 60 + 12</u> = 372

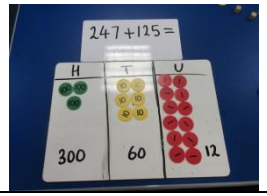
Compact method:</td>
</tr>
</table>

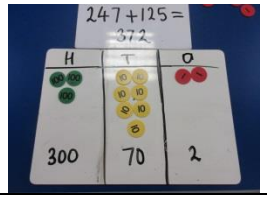




Place value counters





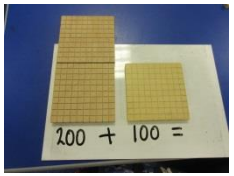
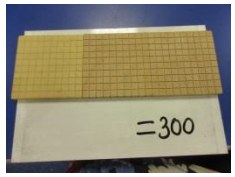
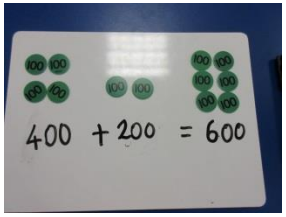
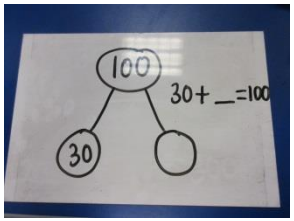
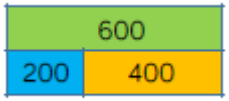
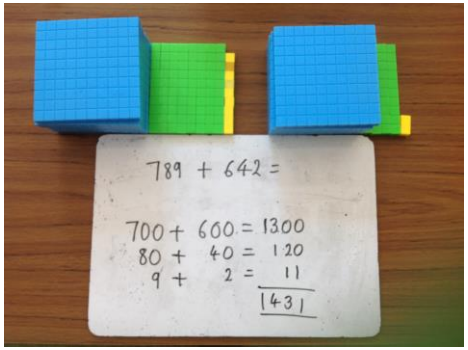


300	60	12

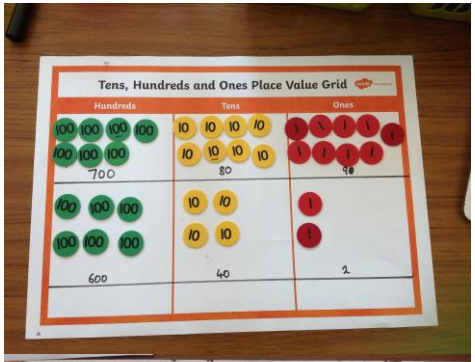
```
 2 4 7
+1 2 5
   1 2
   6 0
 3 0 0
 3 7 2
```

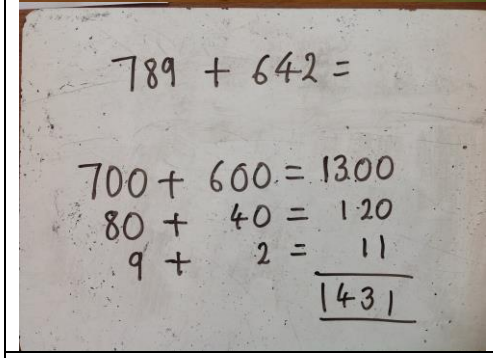
Leading the children to understand the exchange between tens and ones.

Year 4

Concrete	Pictorial	Abstract
Add numbers mentally including two 3-digit numbers (link to known facts)		
<u>Add & Subtract multiples of 100</u> Base 10   Place value counters  	<u>Add & Subtract multiples of 100</u> Part whole  Bar model  100 60 | ? 60 + ? = 100	<u>Add & Subtract multiples of 100</u> 400 + 500 = 900 Include missing numbers 30 + ____ = 100 ____ + 100 = 200 400 + 200 = _____
789 + 642 = Base 10:  789 + 642 =	789 + 642 =  789 1389 1429 1431	789 + 642 becomes 7 8 9 + 6 4 2 1 4 3 1 1 1 Answer: 1431

Place value counters :



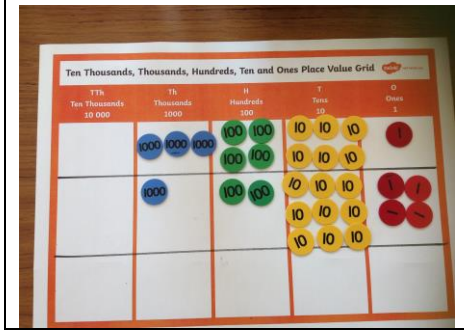


789 + 642 =

Add 4-digit numbers using formal and written methods

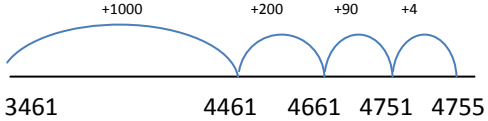
See Year 3 for up to 3-digit number examples.

Place value counters



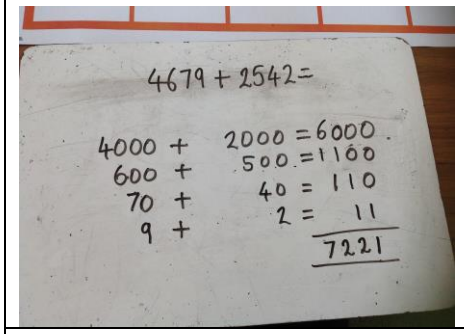
3461 + 1294 =

3461 + 1294 =



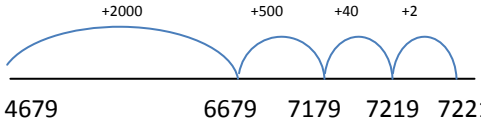
Example 1:

$$\begin{array}{r} 3\ 4\ 6\ 1 \\ +\ 1\ 2\ 9\ 4 \\ \hline 4\ 7\ 5\ 5 \\ {\scriptstyle 1\ \ \ \ } \end{array}$$



4679 + 2542 =

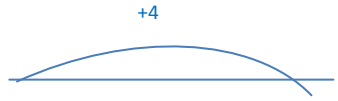
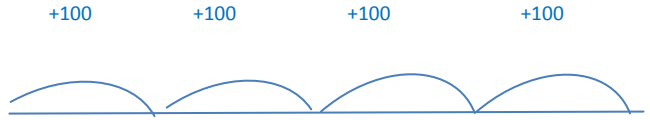
4679 + 2542 =



Example 2:

$$\begin{array}{r} 4\ 6\ 7\ 9 \\ +\ 2\ 5\ 4\ 2 \\ \hline 7\ 2\ 2\ 1 \\ \ \ 1\ \ \ 1\ \ 1 \end{array}$$

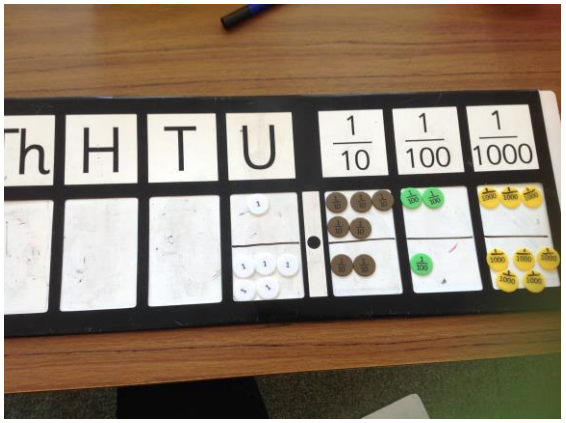
Estimate and use inverse operations to check answers to a calculation.

Year 5		
Concrete	**Pictorial**	**Abstract**
Add whole numbers large numbers and decimals mentally (using known number facts)		
(*Refer back to previous years for concrete examples)*	12946 + 4 =  12672 + 400 =  	12946 + 4 = 1 2 9 4 6 + 4 1 2 9 5 0 1 12672 + 400 = 1 2 6 7 2 + 4 0 0 1 3 0 7 2 1 Missing number problems □4□3□ + 2□5□2 78529
Add whole numbers with up to 5-digits, using formal written methods, including decomposition.		
See Year 4 for up to 4-digit examples		
Add numbers with up to 3 decimal places using formal written methods, including decomposition.		

Place value counters as tenths, hundredths.

1.523 + 5.215 =

Place value counters with chart



5.329 + 2.184 =

1.523 + 5.215 =

	ones	●	1/10	1/100	1/1000
	1	●	5	2	3
	5	●	2	1	5
	6	●	7	3	8

5.329 + 2.184 =

	ones	●	1/10	1/100	1/1000
	5	●	3	2	9
	2	●	1	8	4
	7	●	5	1	3

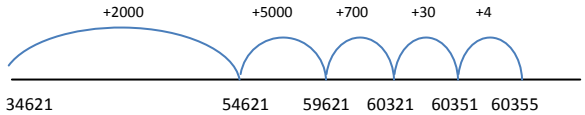
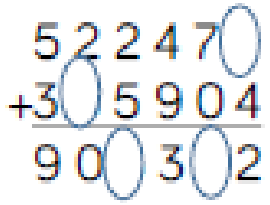
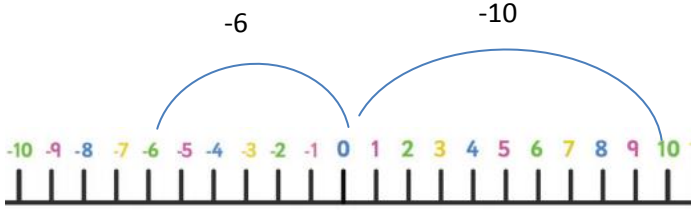
1.523 + 5.215 =

$$\begin{array}{r} 1.523 \\ +\ 5.215 \\ \hline 6.738 \end{array}$$

5.329 + 2.184 =

$$\begin{array}{r} 5.329 \\ +\ 2.184 \\ \hline 7.513 \\ {\scriptstyle 1\ \ 1\ \ \ } \end{array}$$

Year 6

Concrete	Pictorial	Abstract
Add whole numbers with up to 5 digits using formal written methods		
(*Refer back to previous years for concrete examples)*	34621 + 25734 =  532,000 + ? = 631,225 532,000 | ? 631,225	34621 + 25734 = 3 4 6 2 1 + 2 5 7 3 4 5 9 3 5 5 1 Missing number problems 
Add numbers, including negative integers.		
Understanding that we apply certain rules to calculations involving negative numbers. **Calculation** / **Becomes** + + / - - → + + - / - + → -	10 + - 16 = -6  	10 + - 16 = -6 -12 + - 11 = -23