



Growing and Blossoming
"Inclusion, Aspiration, Happiness"

Crossley Hall
Primary School

Calculation Policy

Headteacher: Mrs E Monnery
Deputy Headteacher: Mrs T Bramley



Thornton Road, Fairweather Green,
Bradford, West Yorkshire, BD8 0HJ

T: (01274) 488 703
E: office@chps.paymat.org
www.crossleyhallprimary.co.uk

The Calculation Policy serves as a framework to guide teachers in the effective teaching of mathematical calculations across all year groups. This policy is designed to ensure consistency and progression in the teaching of calculation methods, aligning with the White Rose Maths approach, which emphasises the importance of small steps in learning.

The policy advocates for a concrete, pictorial, and abstract (CPA) approach to teaching calculations. Initially, students engage with concrete materials, such as counters or base ten, to develop a tangible understanding of mathematical concepts. This hands-on experience allows learners to explore and manipulate numbers, fostering a solid foundation in their calculation skills.

Following the concrete stage, students transition to pictorial representations. This involves using drawings or diagrams to visually represent mathematical problems, which helps to bridge the gap between physical manipulation and abstract thinking. Pictorial methods encourage students to visualise calculations, enhancing their comprehension and retention of mathematical concepts.

Finally, the abstract stage introduces numerical symbols and formal methods. At this point, students apply their understanding gained from the concrete and pictorial stages to solve problems using numbers and mathematical operations. This progression ensures that learners are not only able to perform calculations but also understand the underlying principles.

The White Rose Maths framework supports this policy by providing structured resources and guidance for teachers, ensuring that each step in the calculation process is clearly defined and supported by appropriate activities. By implementing this policy, we aim to cultivate confident mathematicians who can approach calculations with a range of strategies, ultimately leading to improved outcomes in mathematics across the curriculum.



Addition

Early Years Foundation Stage

Combining two sets of objects using concrete objects (single digit)

Examples:



To find 1 more and 1 less to 5 using concrete objects

Examples:



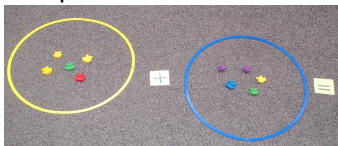
To find 1 more and 1 less to 10 using concrete objects

Examples:



Combining two sets of objects using concrete objects (single digit)

Examples:

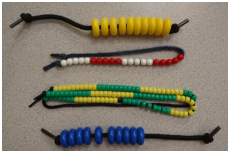


Beginning to read and interpret number sentences

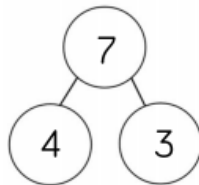
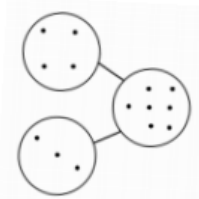
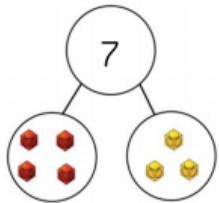
Examples:

Year 1

Adding using concrete objects.(e.g bead strings, counters, Numicon, small world resources)



Use Part, Part, Whole models to add 2 one digit numbers – starting with concrete and then moving onto pictorial and then abstract.

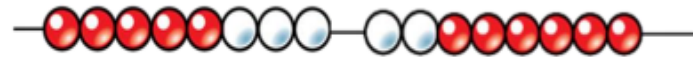


Year 2

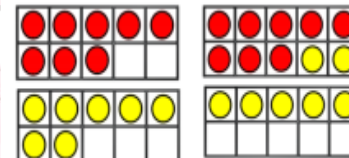
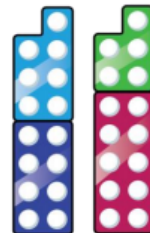
Adding 1 and 2 digit numbers up to 20 (using concrete objects throughout)

Use of bead strings:

$$8 + 7 = 15$$



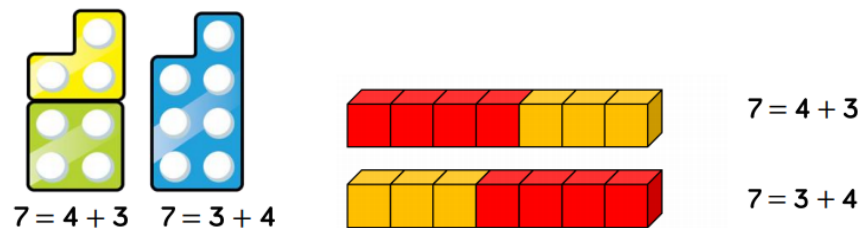
Use of Numicon and Tens Frame:



$$8 + 7 = 15$$

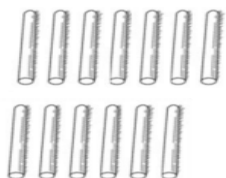
2 5

Use Numicon and cubes to add 2 one digit numbers



Use straws

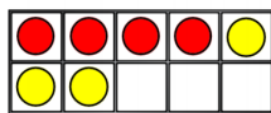
$$7 + 6 = 13$$



bundle together
groups of 10

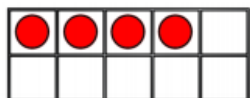


Use tens frame to add 2 one digit objects

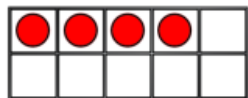


$$\begin{aligned} 4 + 3 &= 7 & 4 \text{ is a part.} \\ 3 + 4 &= 7 & 3 \text{ is a part.} \\ 7 - 3 &= 4 & 7 \text{ is the whole.} \\ 7 - 4 &= 3 \end{aligned}$$

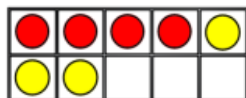
First



Then

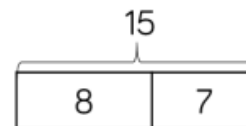
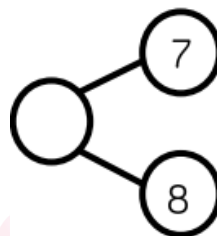


Now



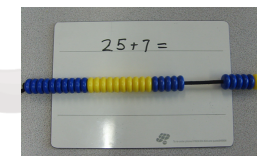
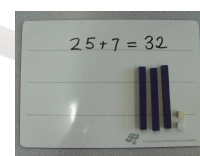
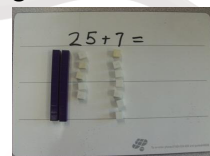
$$4 + 3 = 7$$

Use Part, Part, Whole models and Bar Modelling:

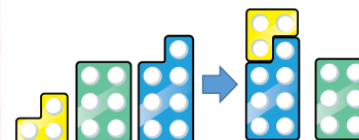
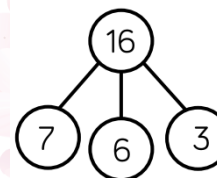


Crossing tens numbers using concrete resources (including bead strings, counters, Numicon, base 10) **within 99**

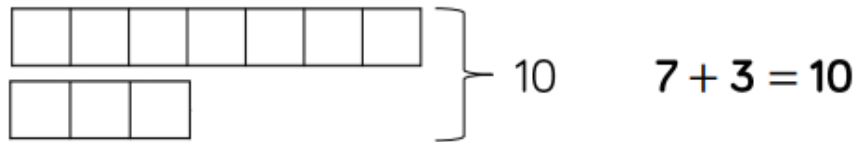
e.g. $25 + 7 =$



Adding 3 one digit numbers



Use discrete bar model to add 2 one digit numbers



Adding using number track and number line (within 10). Begin practically moving counter then move to drawing jumps on

e.g. $3 + 2 = 5$

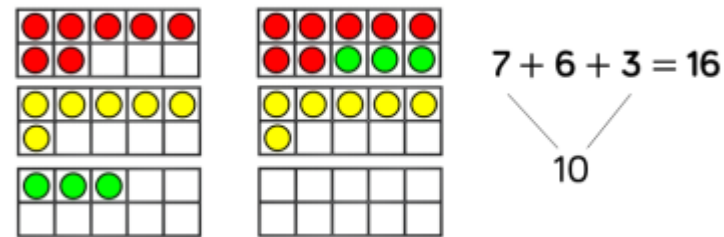


Progressing to crossing the 10 boundary answers within 20

e.g. $3 + 9 = 12$

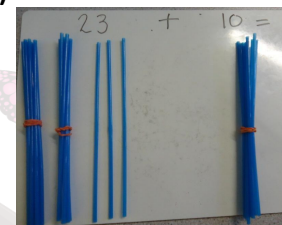
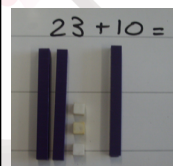


Counting on from biggest number mentally, starting with biggest number (without the number line/number track but can use fingers to support at first)



Adding ten to a number (base ten, straws, number line, hundred square)

e.g. $23 + 10 =$



$23 + 10 = 33$

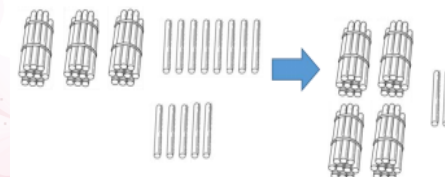
NUMBER SQUARE

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

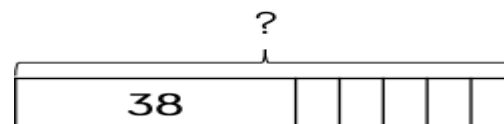
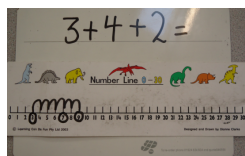
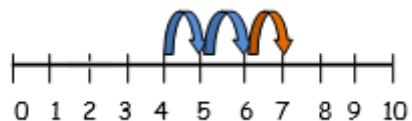
Adding 1 digit and 2 digit numbers up to 100

$$38 + 5 = 43$$

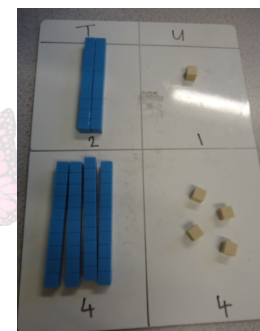
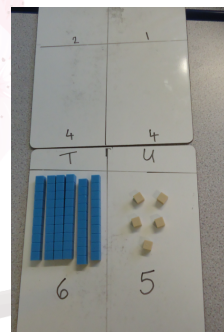
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Adding more than 2 numbers within 10 (concrete-number line and then without a number line)



Column addition using two 2-digit numbers without crossing the tens boundary (using base ten before a written method)

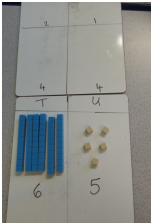


Column addition with two digit numbers with a written method, e.g.

$$\begin{array}{r} \text{T O} \\ 54 \\ + 35 \\ \hline 89 \end{array}$$

Year 3

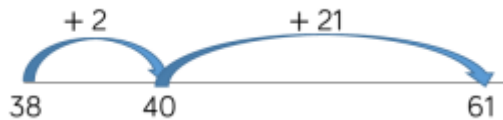
Column addition using 2 two digit numbers (using base ten and concrete materials before a written method) without crossing the tens boundary



Use part, part, whole Model and bar modelling to support pictorial representations

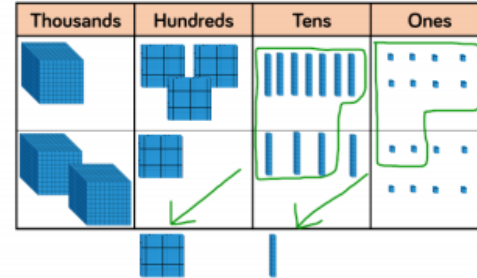
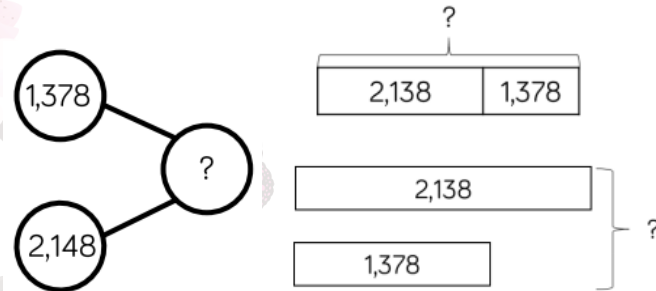


Use of number lines:

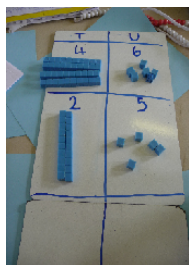
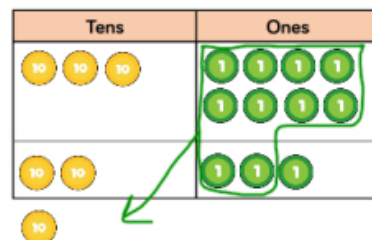
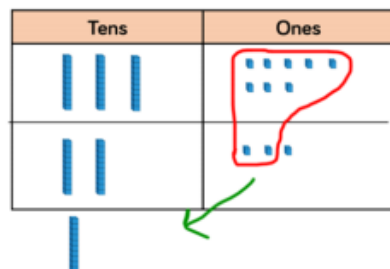


Year 4

Adding numbers with up to 4 digits (Fluency and variation through bar modelling/part, part, whole and missing numbers) Base 10 and place value counters are the most effective to use for this

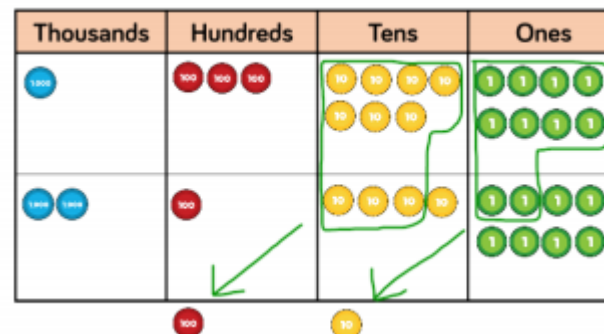
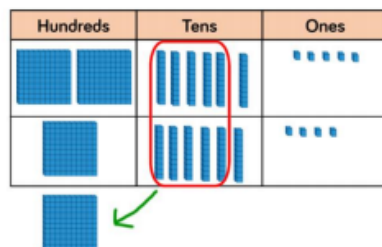
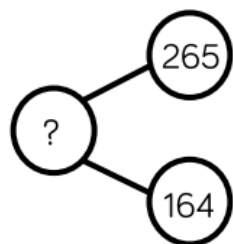


Column addition using 2 two digit numbers crossing the tens boundary
(using base ten before a written method)



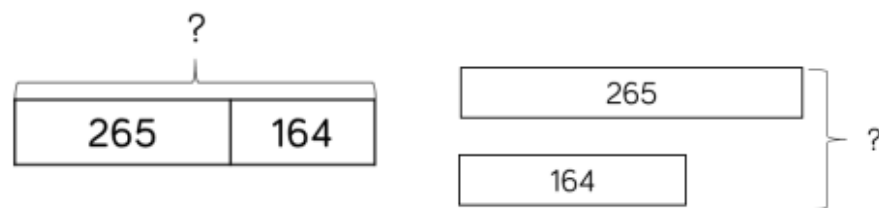
$$\begin{array}{r} 38 \\ + 23 \\ \hline 61 \\ 1 \end{array}$$

Column addition with three digit numbers (using concrete and pictorial representations initially)



$$\begin{array}{r} 1378 \\ + 2148 \\ \hline 3526 \\ 11 \end{array}$$

Use of discrete and continuous bar model:



Column method with and without carrying numbers:

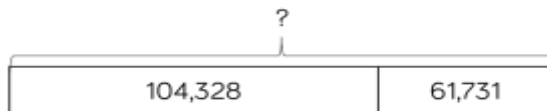
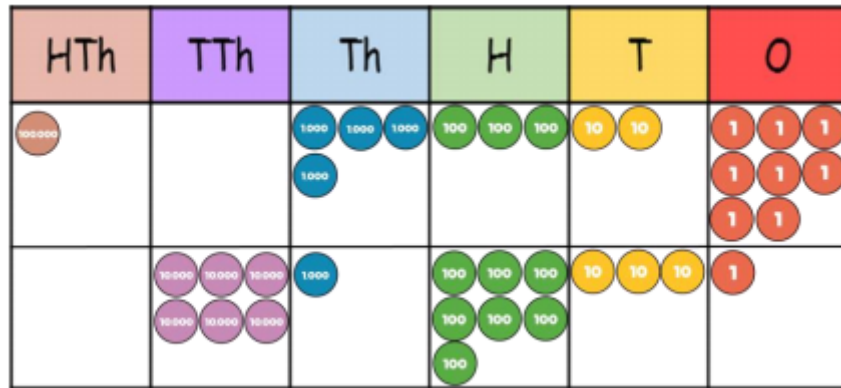
$$\begin{array}{r}
 \text{HTO} \\
 124 \\
 + 235 \\
 \hline
 359
 \end{array}$$

$$\begin{array}{r}
 \text{HTO} \\
 124 \\
 + 186 \\
 \hline
 310 \\
 \hline
 310
 \end{array}$$



Year 5

Adding numbers with 4 or more digits using column addition.

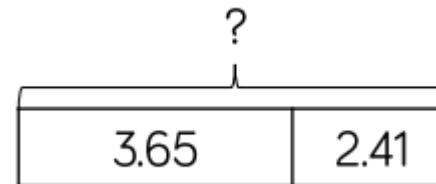


1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9

1

Year 6

Addition to extend to numbers with any number of digits and decimals with up to 3 decimal places



$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \end{array}$$

1

1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9

1

Children continue to develop fluency and variation. At this stage, children should be encouraged to work in the abstract using the column method to add larger numbers efficiently.

Adding using column addition (decimal numbers)

Ones	Tenths	Hundredths
1 1 1	0.1 0.1 0.1	0.01 0.01 0.01
1 1	0.1 0.1 0.1	0.01 0.01
	0.1 0.1 0.1	0.01

1

Ones	Tenths	Hundredths
● ● ● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ●
● ●	● ● ● ● ● ● ● ●	●

●

$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ \hline \end{array}$$

1

Division

Early Years Foundation Stage

To share objects into equal groups using concrete objects (e.g beads, counting bears, small world)

Introduce the terms 'sharing' and 'grouping'

Examples:



Additional activities might include:

- Sharing of milk at break time
- Sharing sweets on a child's birthday
- Sharing activities in the home corner
- Count in tens/twos
- Separate a given number of objects into two groups

Year 1

Use concrete apparatus to solve one step problems involving counting in 2's, 5's and 10's

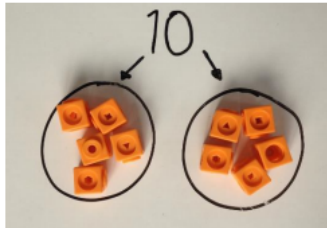
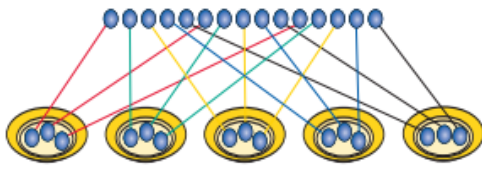
Children need to group and share small quantities - understanding the difference between the two concepts.

Sharing using concrete materials (e.g. small world, counters) before moving onto pictorial

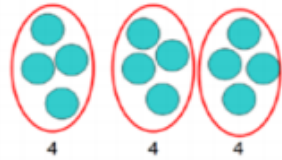


$$15 \div 5 = 3$$

15 shared between 5



Sharing:



12 shared between 3 is 4



Year 2

Introduce children to the $\div$ sign. Children need to calculate number sentences

e.g. Use counters, numicon, base 10



Solve problems through grouping and sharing for division (use practical apparatus, arrays and pictorial representations)

e.g. bead strings, arrays

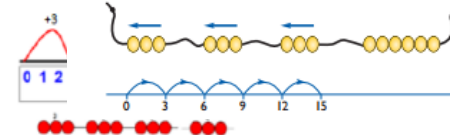


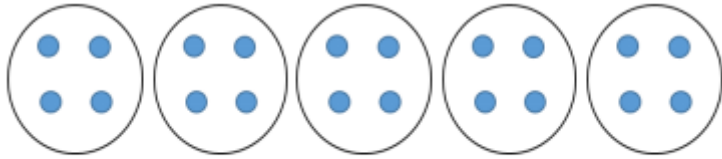
Grouping using a number line

Group from zero in jumps of the divisor to find out 'how many groups of 3 are there in 15?'



Use number line





$$20 \div 5 = 4$$

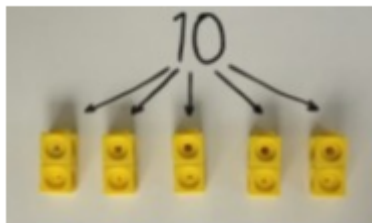
Arrays:

Counting in 2's, 5's and 10's with arrays

E.g. Share these 10 animals equally between 5 people. How many will each child have?

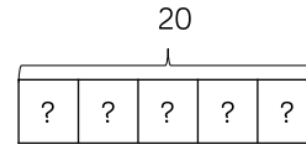
Grouping - children should apply their counting skills of 2,5, and 10s

How many 10's are there in 40?

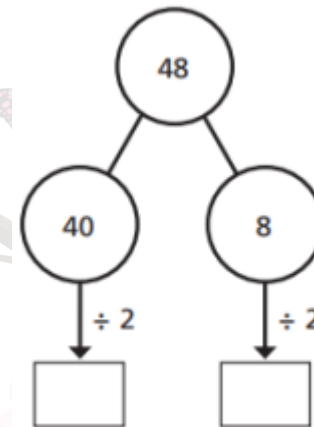


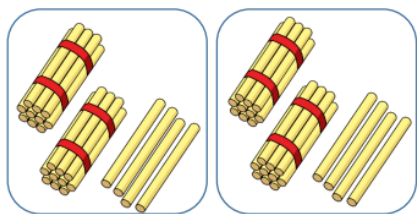
Use concrete resources to support children e.g. numicon, counters,

Introduce bar models for division:



Use of Part, Part, Whole models to support flexible partitioning

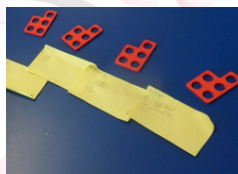
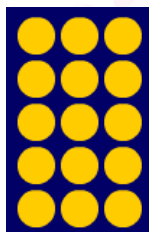
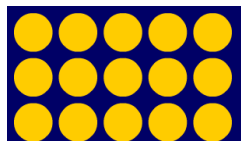




Arrays:

$15 \div 3 = 5$ There are 5 groups of 3.

$15 \div 5 = 3$ There are 3 groups of 5



Year 3

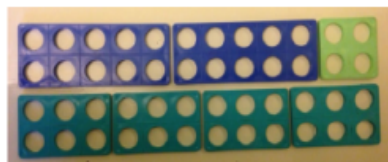
Year 4

Continue using a range of equations as in year 2 but with appropriate numbers.

e.g.

$$\begin{array}{ll} 60 \div 2 = \bullet & \bullet = 60 \div 2 \\ 60 \div \bullet = 30 & 30 = 60 \div \bullet \\ \bullet \div 2 = 30 & 30 = \bullet \div 2 \\ \bullet \div \nabla = 30 & 30 = \bullet \div \nabla \end{array}$$

Use a blank number line to divide by grouping using multiplication facts linked to 2,3,4,5,8, 10 time tables-This includes remainders
Use cubes, counters, objects or place value counters to aid understanding.



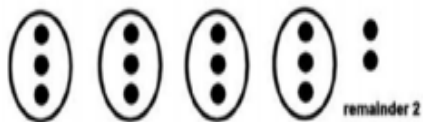
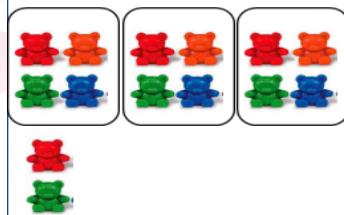
$$96 \div 3 = 32$$



24 divided by 6

Divide objects between groups and see how much is left over

Divide objects between groups and see how much is left over

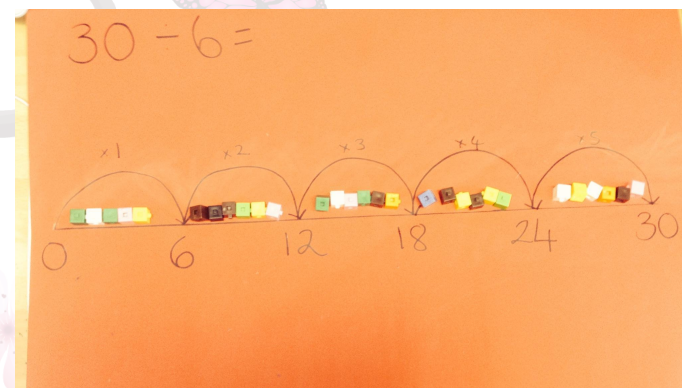


remainder 2



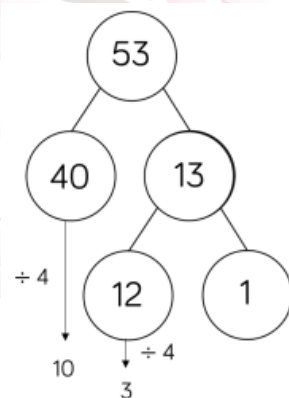
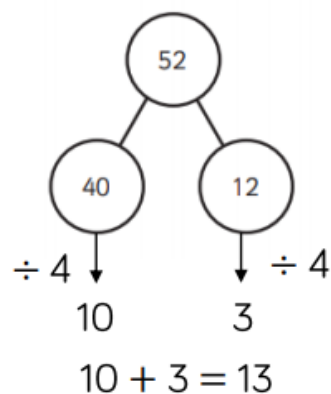
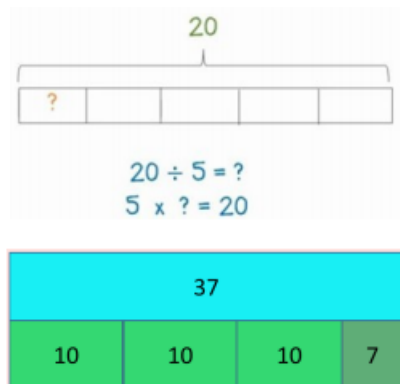
Divide 2 digit by 1 digit

Continue to use concrete resources to support the concept of division
e.g 52 divided by 4

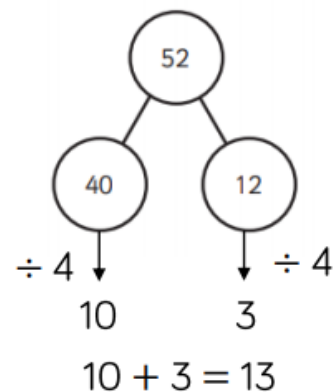


Part Part Whole Model

Continue to use bar modelling/ Part, Part, Whole to aid solving division problems



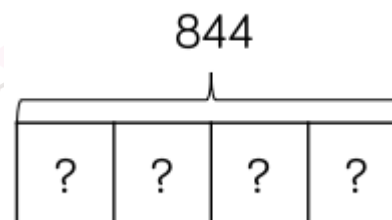
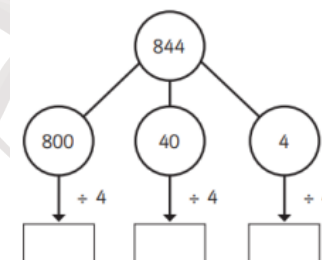
How many 3's are in 15? $15 \div 3$ can be modelled as:



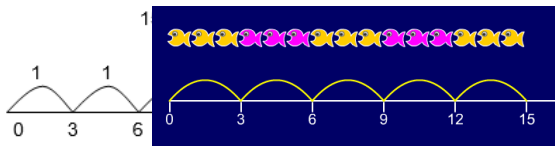
Divide 3 digit by 1 digit

$$844 \div 4 = 211$$

H	T	O
100	10	1
100	10	1
100	10	1
100	10	1



All calculations with 2 and 3-digit dividends. E.g. 126 divided by 5



Chunking on a number line. Children write down number facts/coin facts (x1, x2, x5, x10, x20, x50) to help them make appropriate jumps.

$$15 \div 3 = 5$$

$$1 = 3$$

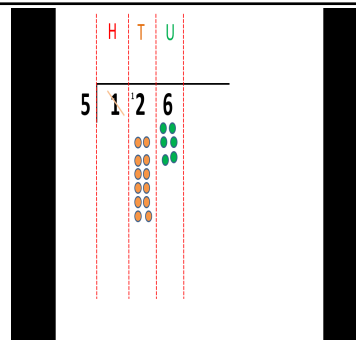
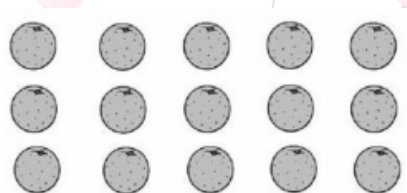
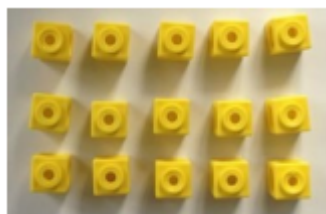
$$2 = 6$$



Children need to apply these methods in problem solving contexts
e.g. 12 sweets shared equally between 4 children/ 4 cakes shared equally between 8 children



Arrays



Chunking method on a number line:

$$76 \div 6 =$$

Pupils write down key facts

$$1 \times 6 = 6$$

$$2 \times 6 = 12$$

$$4 \times 6 = 24$$

$$10 \times 6 = 60$$

$$5 \times 6 = 30$$

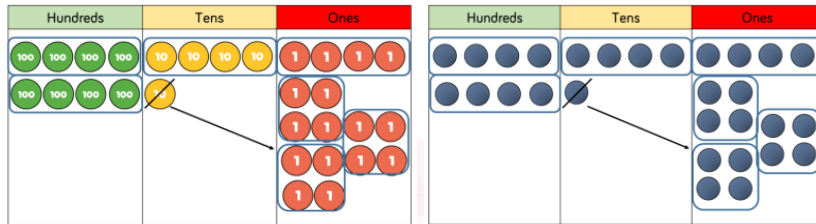


Year 5

Divide 3 digit by 1 digit

Continue with practical modelling as shown in Year 4, leading to the efficient use of a formal method.

$$856 \div 4$$

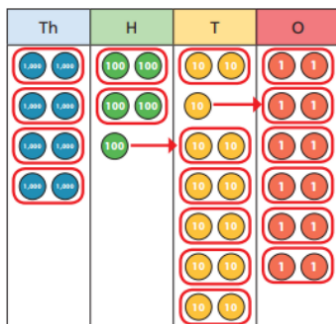


Formal written method for short division - divide numbers up to 4 digits by a one-digit number, including remainders

		2	1	4
	4	8	5	16

Divide 4 digit by 1 digit

Continue with practical modelling, leading to the efficient use of a formal method.



	4	2	6	6
2	8	5	13	12

Year 6

Short division- Bus stop method

		0	3	6
	12	4	43	72

	0	4	8	9
15	7	73	133	135

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

Long division- Bus stop method

		0	3	6
1	2	4	3	2
-		3	6	0
			7	2
-			7	2
				0

$$\begin{array}{l}
 12 \times 1 = 12 \\
 12 \times 2 = 24 \\
 12 \times 3 = 36 \\
 12 \times 4 = 48 \\
 12 \times 5 = 60 \\
 12 \times 6 = 72 \\
 12 \times 7 = 84 \\
 12 \times 8 = 96 \\
 12 \times 9 = 108 \\
 12 \times 10 = 120
 \end{array}$$

Children need to express remainders as fractions and decimals

$98 \div 7$ becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \end{array}$$

Answer: 14

$432 \div 5$ becomes

$$\begin{array}{r} 86 \text{ r} 2 \\ 5 \overline{) 432} \end{array}$$

Answer: 86 remainder 2

$496 \div 11$ becomes

$$\begin{array}{r} 45 \text{ r} 1 \\ 11 \overline{) 496} \end{array}$$

Answer: $45\frac{1}{11}$

	0	4	8	9
15	7	3	3	5
-	6	0	0	0
	1	3	3	5
-	1	2	0	0
		1	3	5
-		1	3	5
				0

$$\begin{array}{l} 1 \times 15 = 15 \\ 2 \times 15 = 30 \\ 3 \times 15 = 45 \\ 4 \times 15 = 60 \\ 5 \times 15 = 75 \\ 10 \times 15 = 150 \end{array}$$

($\times 400$)

($\times 80$)

($\times 9$)

Formal method for long division - children need to be able to divide

$432 \div 15$ becomes

$$\begin{array}{r} 28 \text{ r} 12 \\ 15 \overline{) 432} \\ \underline{30} \\ 13 \\ \underline{12} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

Answer: 28 remainder 12

digit number

$432 \div 15$ becomes

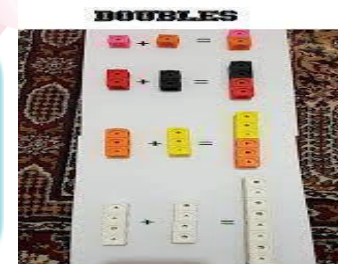
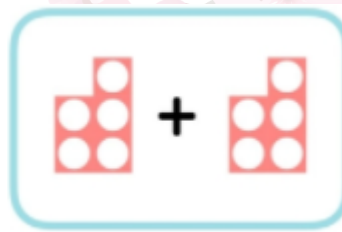
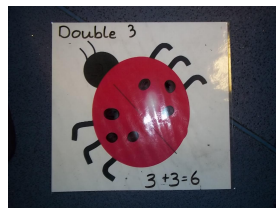
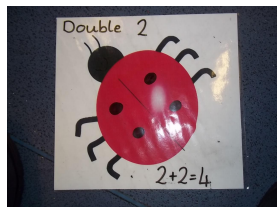
$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 13 \\ \underline{12} \\ 12 \\ \underline{12} \\ 0 \end{array}$$

Answer: 28.8

Multiplication

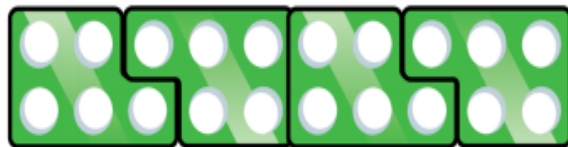
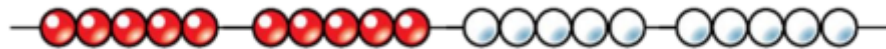
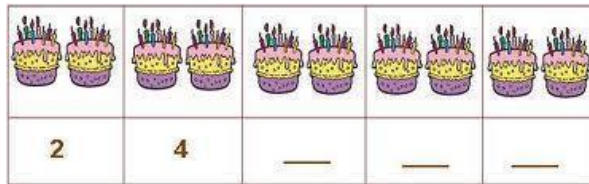
Early Years Foundation Stage

To solve problems using doubling within 20 (using concrete objects)



Year 1

Counting in steps of 2, 5 and 10. Children to use concrete resources and visual representations. There is no expectation for children to record this formally.



Use concrete apparatus to solve one step problems involving counting in 2's, 5's and 10's.

e.g. Counting socks in pairs, Counting fingers



Example question: 5 children have 2 sweets each. How many do they have?

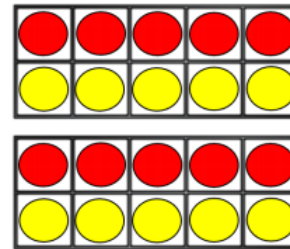
Arrays

Counting in 2's, 5's and 10's with arrays

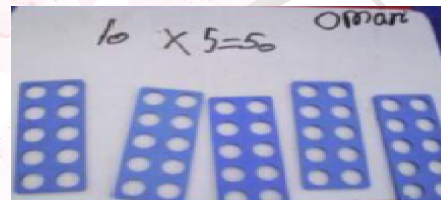
Year 2

Repeated Addition using X2, X5, X10

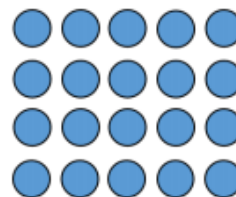
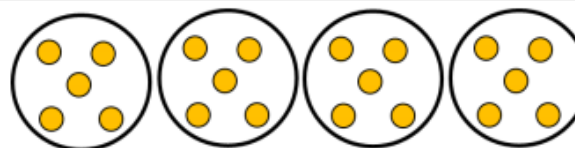
Children continue to use concrete resources and visual representations. Children are introduced to the multiplication symbol



$$5 + 5 + 5 = 15$$



$$10 \times 5 = 50$$

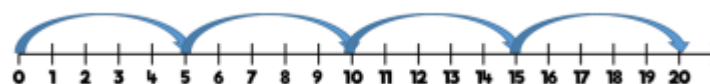


$$5 + 5 + 5 + 5 = 20$$

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

Use of numbered number lines:



Using concrete objects to represent and read arrays for X2, X5 and X10 times tables

Understand that multiplication can be done in any order (commutative)

Use symbols to record ($\times$) in any order. Find related sentences.



Year 3

Using concrete objects/pictorial images to teach X3, X4 and X8 times tables



Year 4

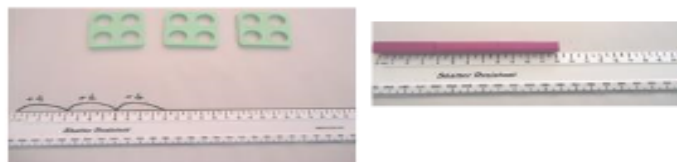
Teach X6, X7, X9 X11 and X12 times tables – Continue to use concrete/pictorial objects to support this.

Children should already know X2, X3, X4, X5, X8, 10 mentally

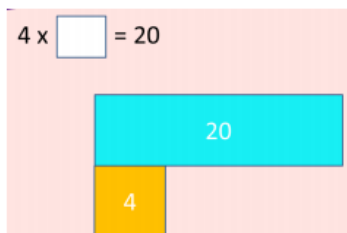
Use of base 10 and place value counters to support the understanding of place value before teaching of the formal method:

Use of number lines to show repeated groups:

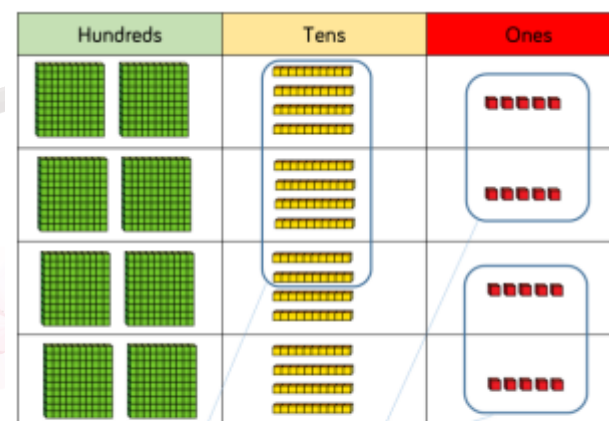
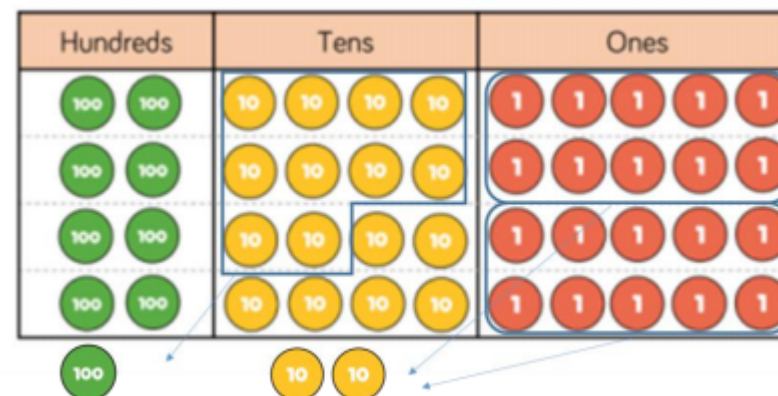
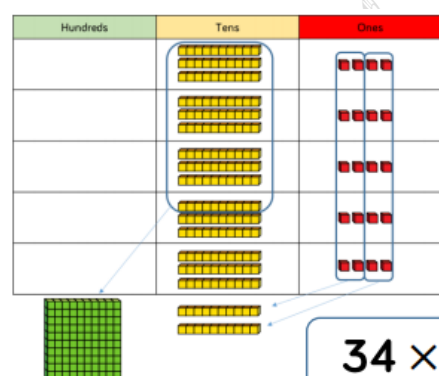
Use number lines to show repeated groups- 3×4



bar modelling to be used to find missing numbers:

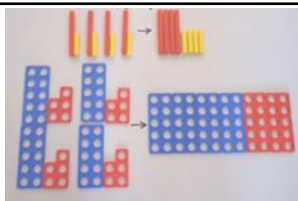


Base 10 to represent multiplication calculations:



245×4

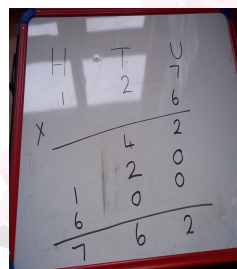
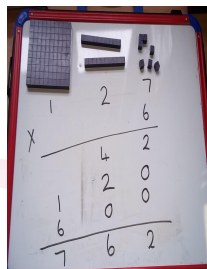
Formal method:



15 x 4

Expanded Column method:

	H	T	O	
		3	4	
x			5	
		2	0	(5 x 4)
+	1	5	0	(5 x 30)
	1	7	0	

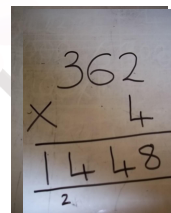


Short column method:

	H	T	O	
		3	4	
x			5	
	1	7	0	
	1	2		

	H	T	O
	2	4	5
x			4
	9	8	0
	1	2	

Formal Method (short Multiplication)





Year 5

Column multiplication of 3.4 digit numbers by 1 digit- Continue to use concrete/pictorial objects to support this.

Children to develop fluency and variation through various pictorial / abstract methods

Hundreds	Tens	Ones

$$327 \times 4$$

Year 6

Column multiplication by 2 digit (Long multiplication) Manipulatives may still be used with the corresponding long multiplication modelled alongside.

$$\begin{array}{r} 32 \\ \times 6 \\ \hline 192 \end{array}$$

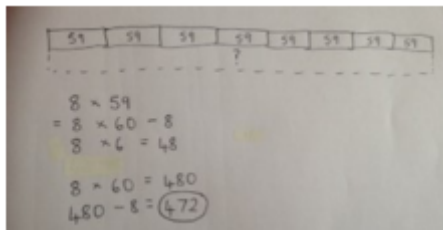
	1	8
$\times$	1	3
	5	4
	2	
1	8	0
2	3	4

$$\begin{array}{r} 1234 \\ \times 16 \\ \hline 7404 \\ 12340 \\ \hline 19744 \end{array}$$

(1234 $\times$ 6)
(1234 $\times$ 10)

Multiplying decimals up to 2 decimal places by a single digit

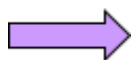
Children can continue to be supported by place value counters at the stage of multiplication



Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods

Expanded and Short column method

$$\begin{array}{r} 327 \\ \times 4 \\ \hline 28 \\ 80 \\ 1200 \\ \hline 1308 \end{array}$$



$$\begin{array}{r} 327 \\ \times 4 \\ \hline 1308 \\ \hline \end{array}$$

Handwritten short column method for 4276×4 . The calculation shows $4276 \times 4 = 17104$.

$$\begin{array}{r} 3.19 \\ \times 8 \\ \hline 25.52 \end{array}$$

Handwritten long multiplication for 72.63×1.40 . The calculation shows $72.63 \times 1.40 = 101.6820$.

Can continue to use expanded method to consolidate place value knowledge and this will support moving to the short column method



Subtraction

Early Years Foundation Stage

To find one more and one less to 5 using concrete objects (counter, small word)

Examples:



To find one more and one less to 10 using concrete objects

Examples:



To find one more and one less to 20 using concrete objects (counter, bead string, small world)

Examples:

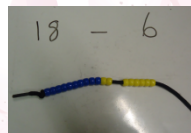
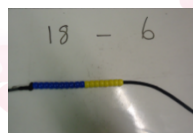
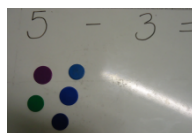


To subtract using concrete objects within 20 (to 5, then to 10 and then to 20)

e.g. $5 - 3 = 2$

$9 - 4 =$

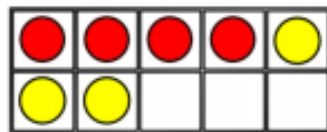
$18 - 6 =$



Year 1

Subtract two 1-digit numbers to 10

Subtracting two 1-digit numbers to 10 using concrete objects. (e.g. counters, small world resources, bead string (10), tens frame (within 10), Numicon, number tracks, number lines)



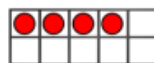
First



Then



Now

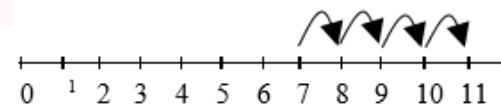


Year 2

Subtract 1 and 2-digit numbers to 100

Subtract 1 and 2-digit numbers to 100 using concrete objects (e.g. hundred square, labelled number lines, straws)

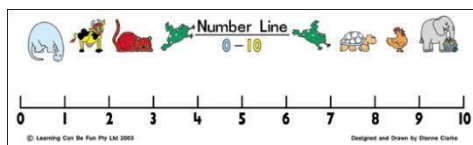
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



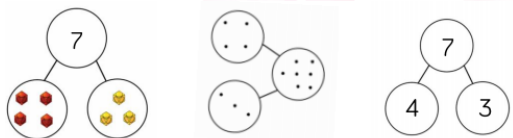
Finding the difference (using e.g. cubes, Numicon, Cuisenaire rods):



The difference between 8 and 5 is 3
How many more than 5 is 8?



Move onto using part, part, whole model to subtract two 1-digit numbers.



Move through concrete (cubes, small world etc), pictorial (e.g. dots) then abstract (numbers).

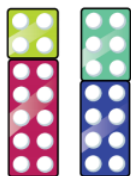
Using bar modelling to subtract two 1-digit numbers



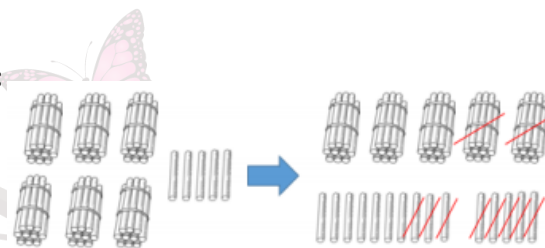
Part-whole models, ten frames and Numicon support partitioning. Cubes and bar models with two bars can support finding the difference. Ten frames, number tracks, single bar models and bead strings support reduction.

Subtract 1 and 2-digit numbers to 20

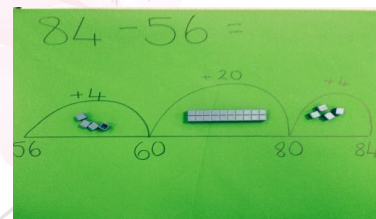
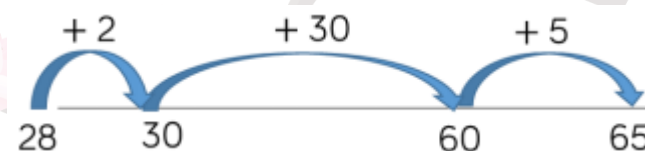
Subtracting 1 and 2-digit numbers to 20 using concrete resources. (e.g. Numicon, bead string (20), hundred square, number track, straws)



Using straws:



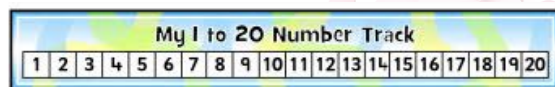
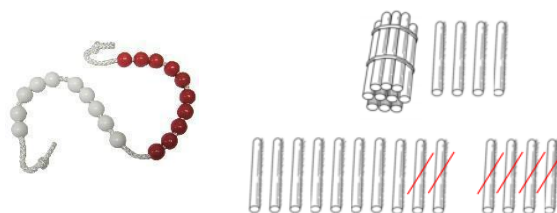
Using a blank number line to count on and find the difference:



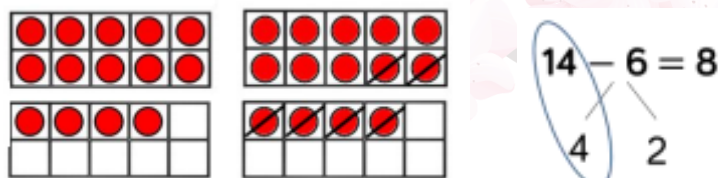
Use Base 10 alongside to support if needed. Encourage pupils to jump to multiples of 10 to become more efficient.

Using Base 10:

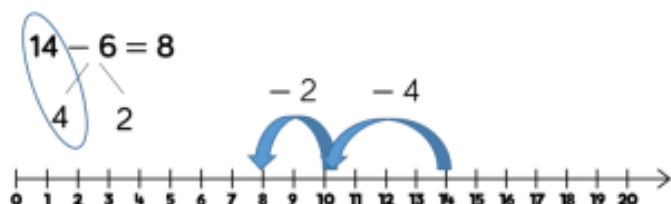
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



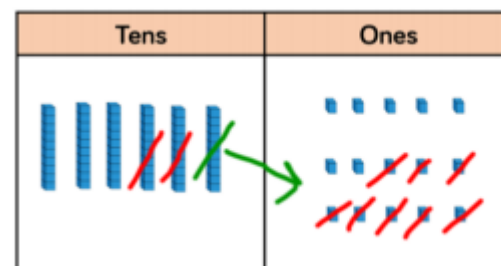
Use of tens frame (within 20):



Use of labelled number lines:

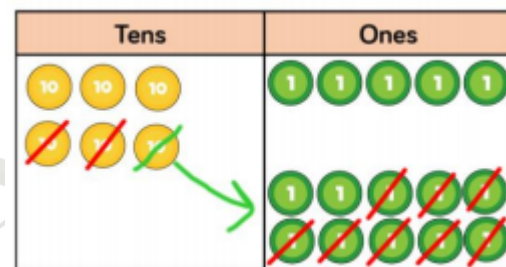


Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten Frames, Numicon and number lines are particularly useful for this.

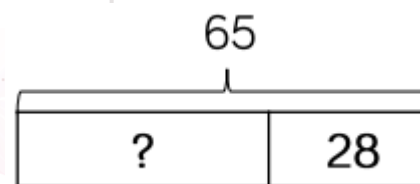
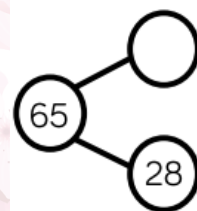


$$\begin{array}{r} 5 \ 1 \\ 65 \\ - 28 \\ \hline 37 \end{array}$$

Using place value counters:



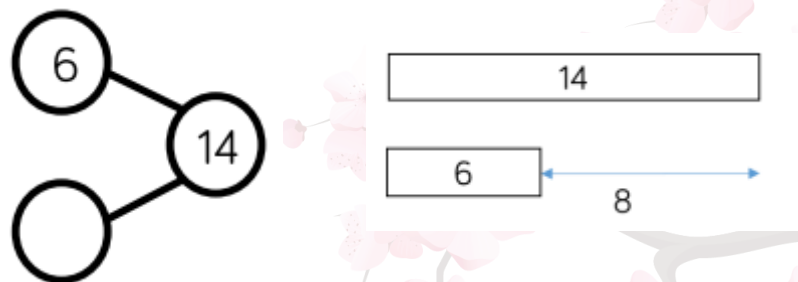
Using part, part, whole model and bar modelling:



$$\begin{array}{l} 17 - 3 = \square \\ 23 - \square = 14 \\ \square - 13 = 34 \\ \square - \nabla = 24 \end{array}$$

$$\begin{array}{l} \square = 17 - 3 \\ 24 = \square - 13 \\ 24 = 7 - \square \\ 24 = \square - \nabla \end{array}$$

Using Part, Part, Whole and bar models to subtract:



Encourage children to use the formal method when calculating alongside straws, base ten or place value counters. As numbers become larger, straws become less efficient.

Using Base 10 to develop conceptual understanding of formal methods:

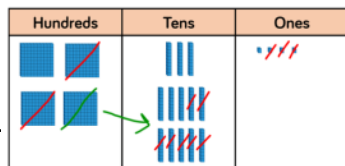
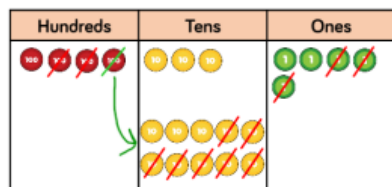


Year 3

Subtract numbers with up to 3 digits

Use Base 10, part, part, whole models and place value counters to subtract numbers with up to 3 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

$$435 - 273 = 262$$



$$\begin{array}{r} 435 \\ - 273 \\ \hline 262 \end{array}$$

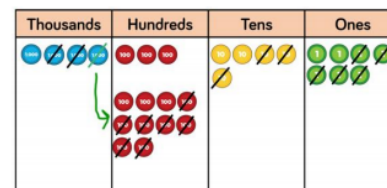
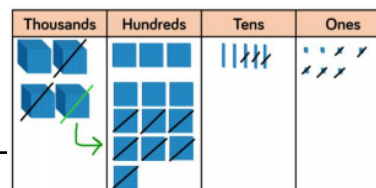
Year 4

Subtract numbers with up to 4 digits

Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

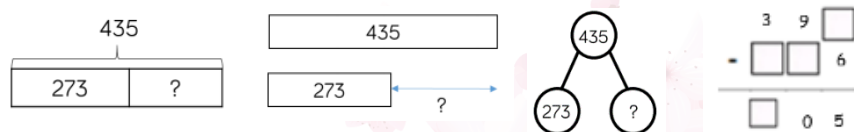
$$4,357 - 2,735 = 1,622$$

$$\begin{array}{r} 4357 \\ - 2735 \\ \hline 1622 \end{array}$$



Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits. Plain counters on a place value grid can also be used to support learning.

Developing fluency and variation through bar modelling, part, part, whole and missing numbers:

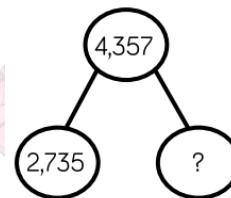


Continue to use Base 10 to develop conceptual understanding of formal methods

Plain counters on a place value grid can also be used to support learning.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Using part, part, whole model:

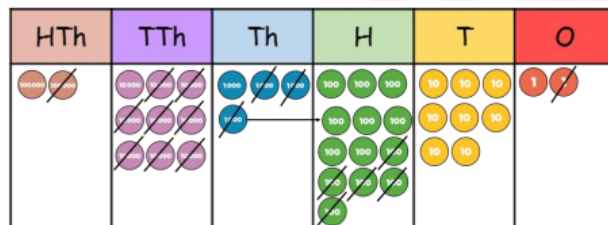


Year 5 & 6

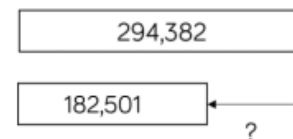
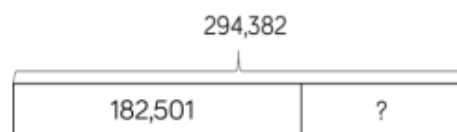
Subtract with more than 4 digits

Use place value counters, part, part, whole model and bar models to subtract numbers with more than 4 digits.

$$294,382 - 182,501 = 111,881$$



Place value counter or plain counters on a place value grid are the most effective concrete resource when subtracting more than 4 digits.

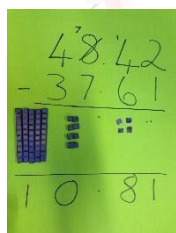


At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

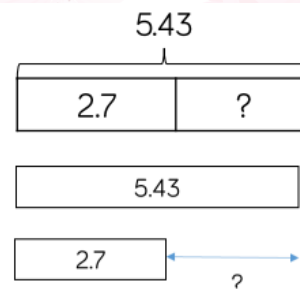
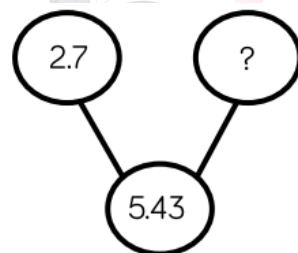
	2	9	3	¹ 3	8	2
-	1	8	2	5	0	1
	1	1	1	8	8	1

Subtract with up to 3 decimal places

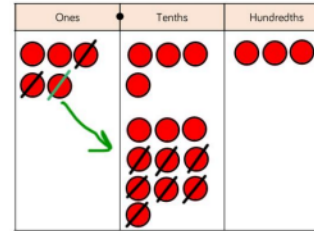
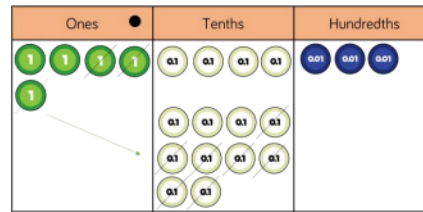
Using Base 10 to subtract decimals:



Using part, part, whole model and bar models:



Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.



At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers more efficiently.

Begin subtracting using numbers with the same number of decimal places. Start with 1 decimal place then ensure children have experience of subtracting decimals with a variety of places. This includes putting this into context when subtracting money and other measures.

$$\begin{array}{r} 87.9 \\ - 32.6 \\ \hline 54.3 \end{array}$$

$$48.42 - 37.61 =$$

$$\begin{array}{r} 48.42 \\ - 37.61 \\ \hline 10.81 \end{array}$$

$$\begin{array}{r} \text{£ } 8.1 \\ - \text{£ } 7.14 \\ \hline \text{£ } 0.96 \end{array}$$