



Gentleshaw Primary Academy

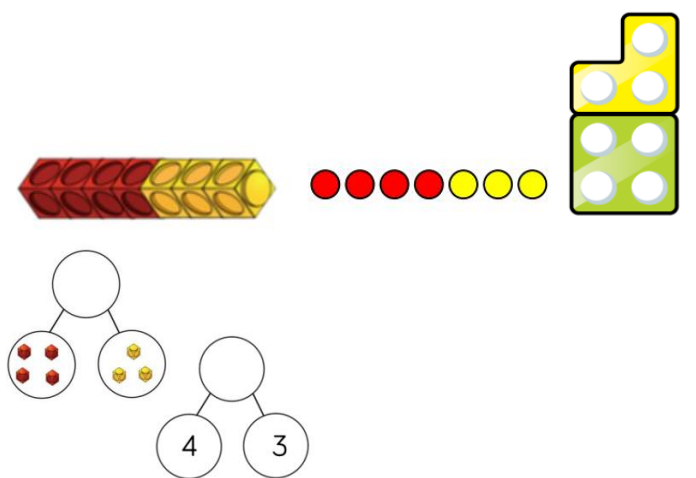
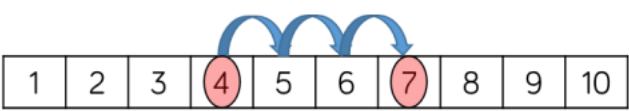


Representations and Formal Written Methods Calculation Policy 2023

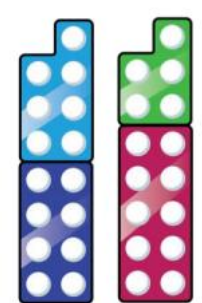

Addition and Subtraction

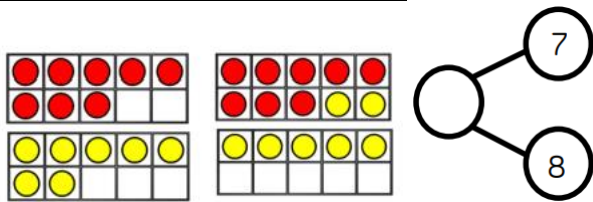
KS1 and KS2

Year 1 – Addition – Add 1-digit numbers within 10

Representations	Formal Method	Skill
	<div style="text-align: center;"> $4 + 3 = 7$  </div>	<p>When adding numbers to 10, children explore both combining and counting on to reach an answer.</p> <p>Concrete manipulatives such as cubes, counters and numicon are used to combine amounts when adding together. Part-whole models and 10 frames are used to support combining.</p> <p>Number tracks are used to support counting on.</p>

Year 1 – Addition – Add 1 and 2-digit numbers to 20

Representations	Formal Method	Skill
	<div style="text-align: center;"> $8 + 7 = 15$  </div> <p>In readiness for Year 2: Children can move onto using a numberline to count on. (A number track has all of the numbers on, whereas a numberline will start with the starting value of the problem. Children are encouraged to do their own jumps and count on).</p>	<p>When adding 1 and 2-digit numbers to 20, children will explore both combining and counting on.</p> <p>Concrete manipulatives such as cubes, counters and numicon will be used to support combining. Part-whole models and</p>

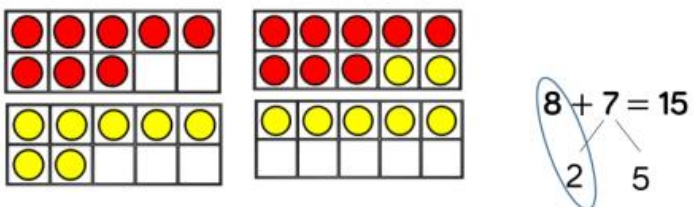


tens frames will support combining.

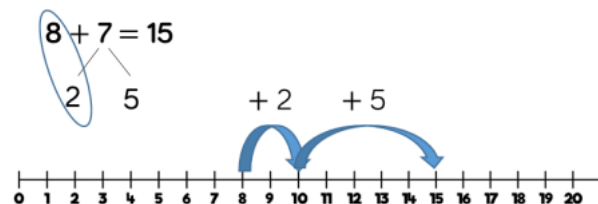
Children will move on to using a number track to count on from a given number. This method will be used even when bridging 10.

Year 2 – Addition – Add 1 and 2-digit numbers to 20

Representations



Formal Method



Skill

In Year 2, children develop their understanding of bridging 10, by using flexible partitioning, tens frames and numberlines.

Children begin by using concrete manipulatives such as cubes, counters and numicon, before moving onto using tens frames to represent the number bonds to 10. Children then move onto the formal method of using a numberline to show their partitioned jumps.

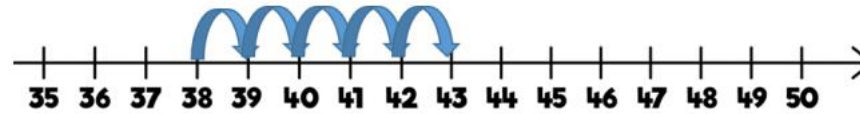
Year 2 – Addition – Add 1 and 2-digit numbers to 100

Representations

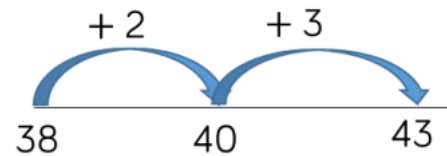
Children may be exposed to tens frames and hundred squares to support them in recognising the number bonds. Exposing children to hundreds squares will also support children in counting on.

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

Formal Method



Children will begin by using a numberline to count on in 1-digit increments from the largest number, before moving onto using flexible partitioning and number bonds to add more efficiently.



Skill

When adding a 1-digit number to a 2-digit number, children will begin by counting on from the largest number. They will move onto using number bonds to support with more efficient addition. e.g. $8 + 5 = 13$ so $38 + 5 = 43$.

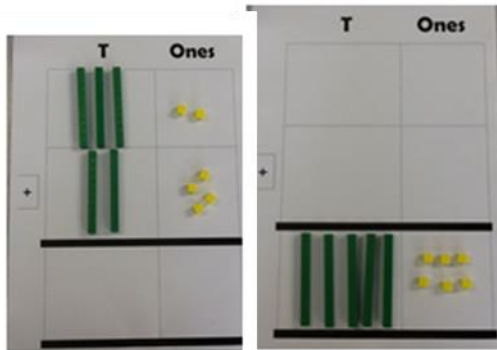
Children will be exposed to hundred squares to find the number bond to 10.

Year 2 – Addition – Add two 2-digit numbers to 100

Representations

Concrete (without exchange)

$$32 + 24 = 56$$



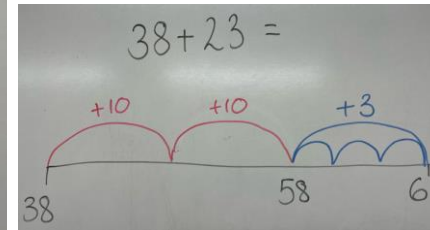
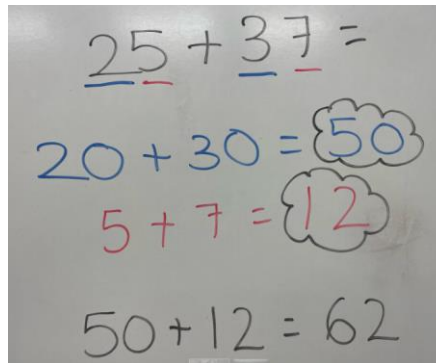
Children will use diennes blocks to create the numbers, partitioning into tens and ones. Children should be encouraged to combine the blocks together below (this will set the children up for the layout of the formal written method when they see it for the first time in Year 3).

Concrete (with exchange)

$$37 + 25 = 62$$

Formal Method

$$38 + 23 = 61$$

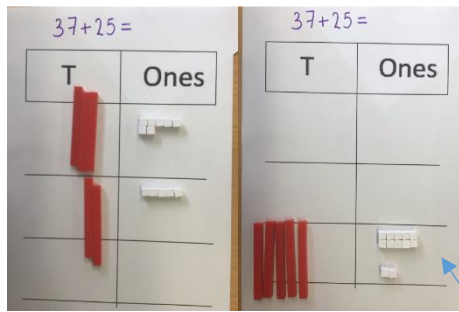


Skill

In Year 2, children will be exposed to both partitioning and counting on.

Children will begin by using concrete materials such as diennes blocks to create and partition the numbers into tens and ones, and then combing the blocks to add the numbers together, before moving onto partitioning in the abstract form.

Children will also use a numberline to count on from the largest number. Children should be encouraged to jump in increments of tens and ones.

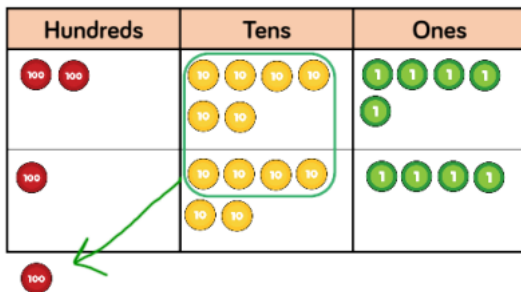
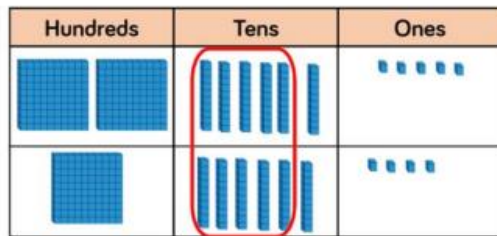


When exchanging, allow children to physically exchange the diennes blocks.

7 + 5 = 12 so we now have 12 ones. We need to 'go to the bank' and exchange 10 ones for one ten.

Year 3 – Addition – Add numbers with up to 3-digits

Representations



Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

$$38 + 23 = 61$$

$$265 + 164 = 429$$

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

$$\begin{array}{r} 265 \\ + 164 \\ \hline 429 \\ 1 \end{array}$$

Children will first be exposed to the formal written addition method in Year 3. Children will begin with two 2-digit numbers, before moving onto adding two 3-digit numbers. Ensure that children are drawing the two lines, so that exchanges are made below.

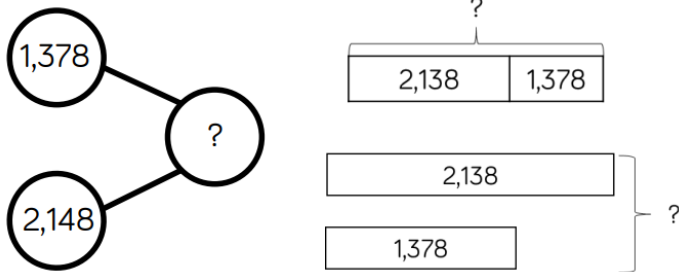
Skill

When adding numbers with up to 3-digits, children will begin by using concrete manipulatives such as diennes and place value counters (placed in place value charts) before moving onto the formal written method.

When using concrete manipulatives, encourage children to physically exchange below the place value grid to reflect the written method.

Year 4 – Addition – Add numbers with up to 4 digits

Representations



Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

$$1,378 + 2,148 = 3,526$$

	1	3	7	8
+	2	1	4	8
<hr/>				
	3	5	2	6
	1	1		

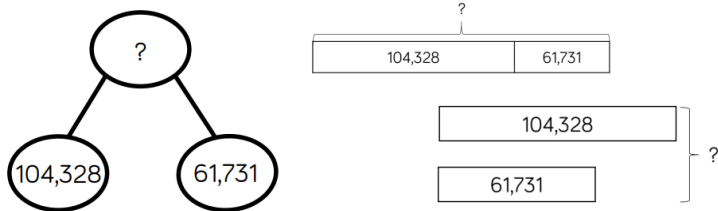
Skill

In Year 4, children extend their understanding of the formal written method for addition, extending it to 4-digit numbers.

Children will also be exposed to other representations such as bar models and part-whole models in Year 4.

Year 5 and 6 – Addition – Add numbers with more than 4 digits

Representations



Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

$$104,328 + 61,731 = 166,059$$

1	0	4	3	2	8
+	6	1	7	3	1
<hr/>					
1	6	6	0	5	9
					1

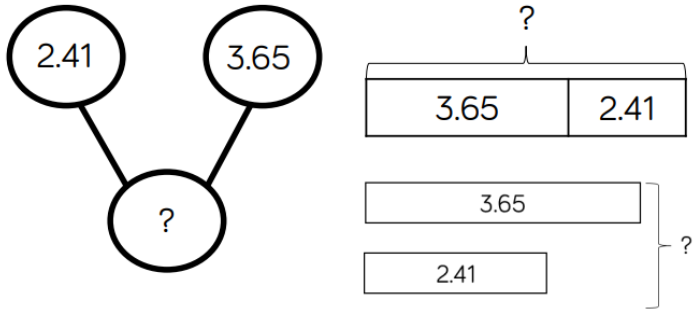
Skill

In Years 5 and 6, children extend their understanding of the formal written method for addition, extending it to 6-digit numbers.

Children will also be exposed to other representations such as bar models and part-whole models in Years 5 and 6.

Year 5 – Addition – Add with up to 3 decimal places

Representations



Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

$$3.65 + 2.41 = 6.06$$

$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ 1 \end{array}$$

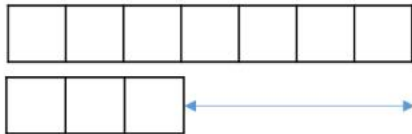
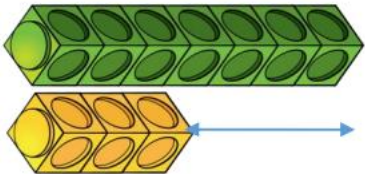
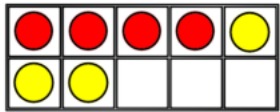
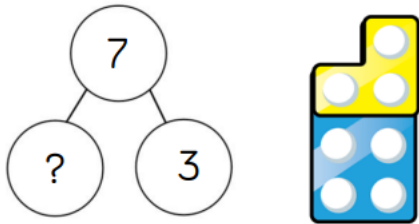
Skill

In Year 5, children will extend their understanding of the formal written addition method to add with decimals.

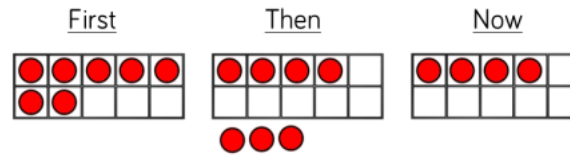
Place value counters can be used to support the understanding of exchanges as they are now encountering decimals.

Year 1 – Subtraction – Subtract 1-digit numbers within 10

Representations



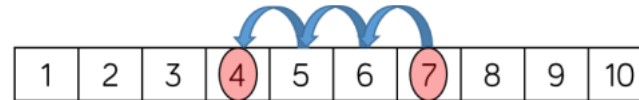
Formal Method



First, Then, Now stories and representations will be used to support children in understanding the method of subtraction by putting into context.

Children will then move onto using a number track to count backwards from a given number.

$$7 - 3 = 4$$



In readiness for Year 2: Children can move onto using a numberline to count back. (A number track has all of the numbers on, whereas a numberline will start with the starting value of the problem. Children are encouraged to do their own jumps and count back).

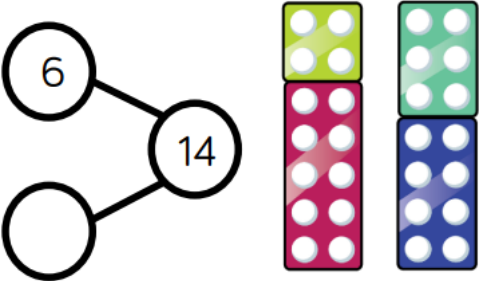
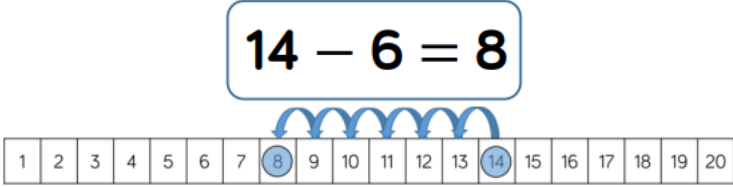
Skill

When subtracting numbers within 10, children will begin using concrete manipulatives such as double sided counters, tens frames, cubes and numicon, to partition the value.

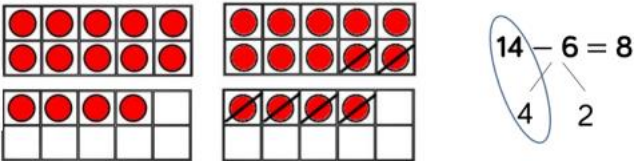
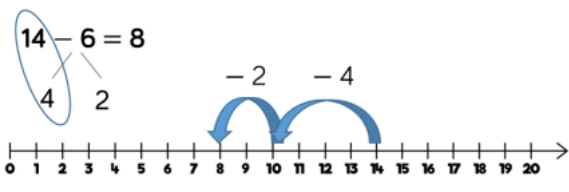
Number tracks will then be used to support counting backwards.

Cubes and bar models will be used to support children in finding the difference.

Year 1 – Subtraction – Subtract 1 and 2-digit numbers to 20

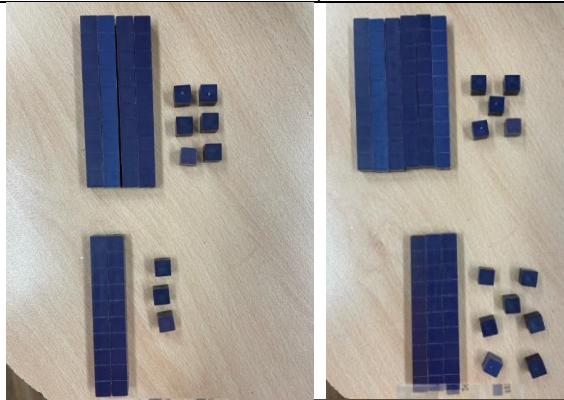
Representations	Formal Method	Skill
	<p style="text-align: center;">$14 - 6 = 8$</p>  <p>In readiness for Year 2: Children can move onto using a numberline to count back. (A number track has all of the numbers on, whereas a numberline will start with the starting value of the problem. Children are encouraged to do their own jumps and count back).</p> <p>In readiness for Year 2: Children should begin to use their number bonds to 10 when partitioning the subtracted number. Ten frames and number tracks will be particularly useful for this.</p>	<p>When subtracting numbers that cross 10, number tracks will be used to support counting back at this early stage. Children will count back from the largest number in increments of one.</p> <p>Part whole models and numicon can be used to support this.</p>

Year 2 – Addition – Subtract 1 and 2-digit numbers to 20

Representations	Formal Method	Skill
		<p>In Year 2, the focus should develop from the strategies used in Year 1, to focusing on using number bonds to 10 to partition the subtracting number.</p> <p>Tens frames will be used to support this initially, before moving onto using a numberline to show the jumps.</p>

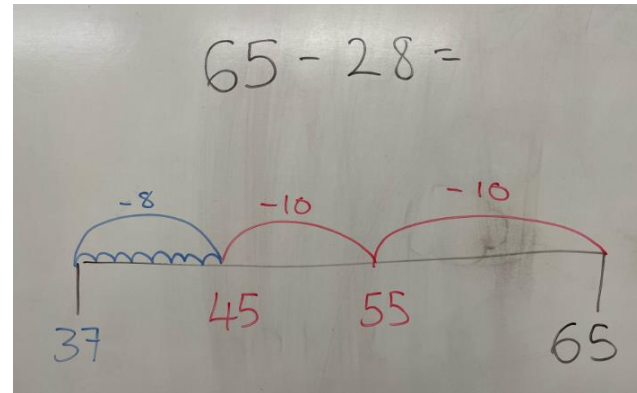
Year 2 – Subtraction – Subtract 1 and 2-digit numbers to 100

Representations



Formal Method

$$65 - 28 = 37$$



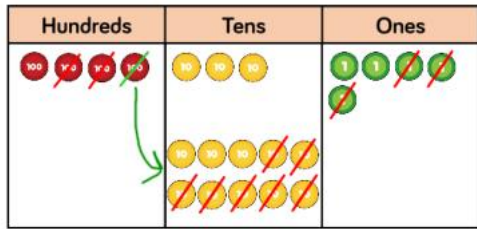
Children will use a numberline to count backwards in increments of tens and ones. The starting number will be placed at the end of the numberline, so that children are showing their jumps backwards, not forwards.

Skill

When subtracting 1 and 2-digit numbers to 100, children will use concrete manipulatives such as counters and diennes blocks to support in the subtraction, before moving onto using a numberline to count back in increments of tens and ones.

Year 3 – Subtraction – Subtract numbers with up to 3-digits

Representations



435

273

Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

$$65 - 28 = 37$$

$$435 - 273 = 162$$

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

$$\begin{array}{r} 3 \quad 1 \\ 435 \\ - 273 \\ \hline 162 \end{array}$$

Children will first be exposed to the formal written subtraction method in Year 3. Children will begin with two 2-digit numbers, before moving onto subtracting two 3-digit numbers. Ensure that children are drawing the two lines, and that exchanges are made above.

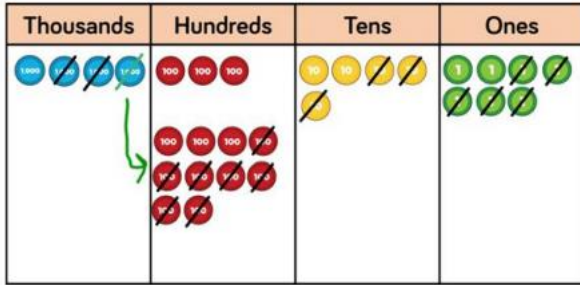
Skill

When subtracting numbers with up to 3-digits, children will begin by using concrete manipulatives such as diennes and place value counters (placed in place value charts) before moving onto the formal written method.

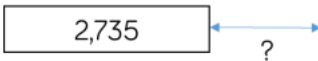
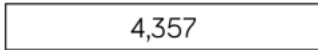
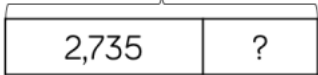
When using the formal written method, exchanges will be made above the top number.

Year 4 – Subtraction – Subtract numbers with up to 4 digits

Representations



4,357



Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

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

$$\begin{array}{r} 3 \ 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

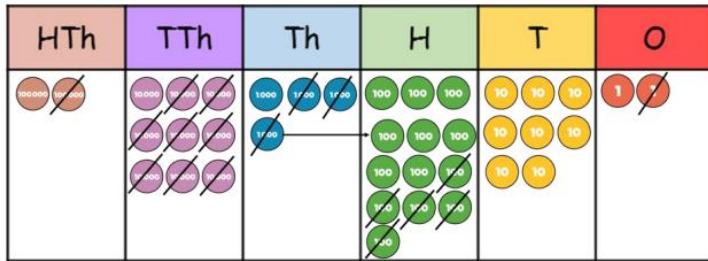
Skill

In Year 4, children extend their understanding of the formal written method for subtraction, extending it to 4-digit numbers.

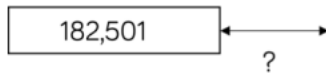
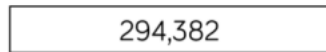
Children will also be exposed to other representations such as bar models for finding the difference.

Year 5 and 6 – Subtraction – Subtract numbers with more than 4 digits

Representations



294,382



Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

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

	2	9	3	13	8	2
-	1	8	2	5	0	1
	1	1	1	8	8	1

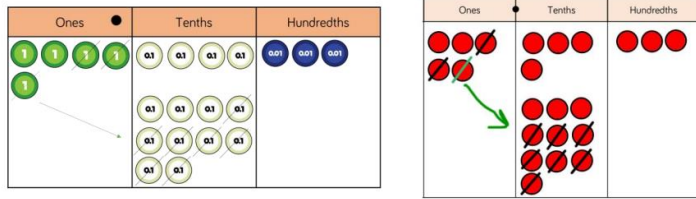
Skill

In Year 5 and 6, children extend their understanding of the formal written method for subtraction, extending it to 6-digit numbers.

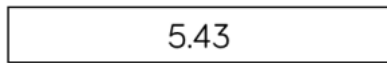
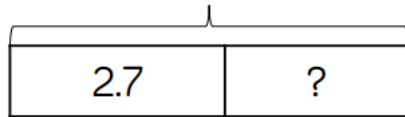
Children will also be exposed to other representations such as bar models for finding the difference.

Year 5 – Addition – Add with up to 3 decimal places

Representations



5.43



Children will be exposed to these different representations, however the focus will be on the formal written method.

Formal Method

$$5.43 - 2.7 = 2.73$$

$$\begin{array}{r} 4 \quad 1 \\ 5.43 \\ - 2.7 \\ \hline 2.73 \end{array}$$

Skill

In Year 5, children will extend their understanding of the formal written subtraction method to subtract with decimals.

Place value counters can be used to support the understanding of exchanges as they are now encountering decimals.