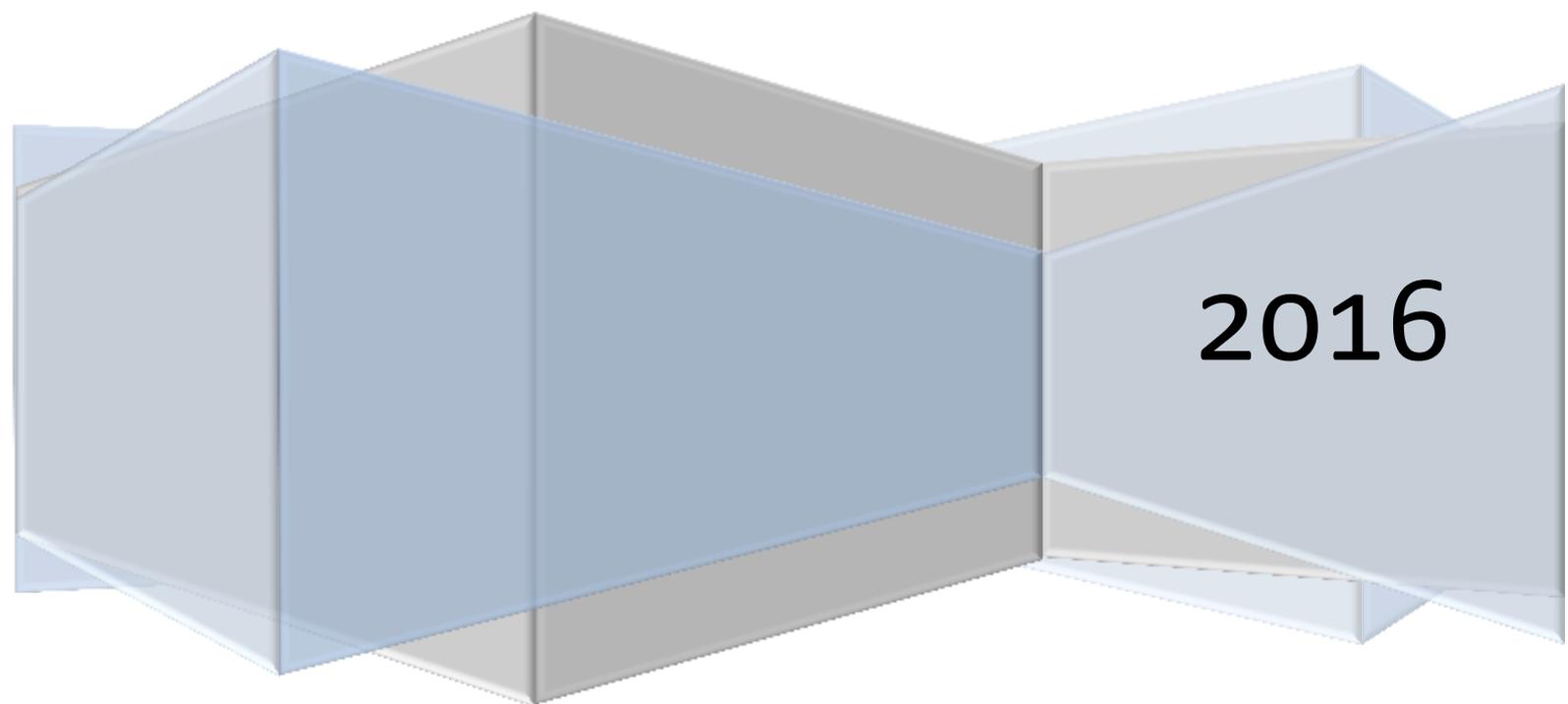


Whimble Primary School

Maths Calculation Policy

Subtraction

Carole Shilston



2016

Stages in Subtraction

Early Stages (EYFS)

Children will engage in a variety of counting songs and rhymes and practical activities. They will begin to relate subtraction to '**taking away**' using objects to count 'how many are left' after some have been taken away. They will also begin to **count back** from the largest number and to **count on** from the smallest to the largest number.

They will find one less than a given number.

In practical activities and through discussion they will begin to use the vocabulary associated with subtraction.

Partitioning structure - take away

A situation in which a quantity is partitioned off in some way. Subtraction related to '**taking away**' a number of objects.

❖ Using objects:



'Take two apples away, how many are left?'

Key language to be developed: take away, how many left? How many are not? How many do not?

For example:

I had 10 chocolates and ate 2 of them. How many are left for tomorrow?

There are 9 birds sitting on a fence. 3 fly away. How many are still on the fence?

I had 12p and I spent 3p. How much did I have left?

❖ Using images of number: for example Numicon



Lots of work with objects and images to ensure children get to the point where they understand that 6 subtract 2 always makes 4.

Stages in Subtraction

Reduction structure

This refers to a situation in which a quantity is reduced by some amount.

❖ Using a number track

For example: I start with 13 pencils and I give 5 away; so I start on 13 and count back 5.



Key language to be developed: start at and reduce by, count back by, go down by.

For example:

If the price of a comic costing £11 is reduced by £3, what is the new price?

Life contexts:

Cost reductions in shops - £1 off, etc

Council tax bill of £625 is cut by £59

Comparison structure (finding the difference)

Subtraction is required to make a comparison between two quantities.

For example:

There are 13 boys and 11 girls in the class. How many fewer girls are there?

❖ Using objects or pictures



How many boys do not have a partner?

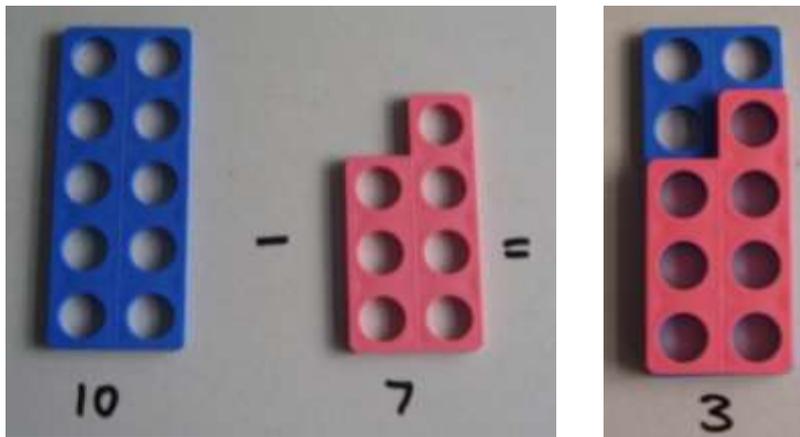
Stages in Subtraction

Key language to be developed: What is the difference? How many more? How many less (or fewer)? How much greater/ How much smaller?



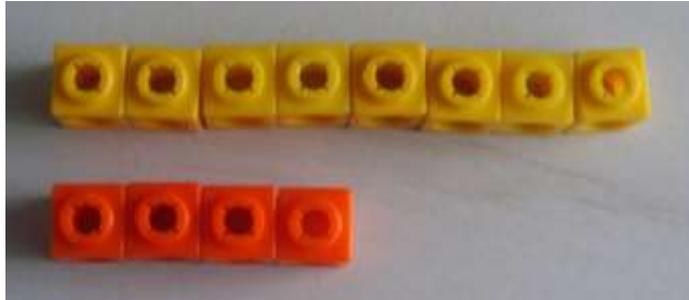
Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures etc.

❖ Using images of number: for example Numicon



Stages in Subtraction

❖ Using images of number: for example multilink



For example:

How many more yellow cubes are there than orange cubes? Subtraction of the smaller number from the greater enables us to determine the difference, or to find out how much greater or how much smaller one quantity is than the other.

Making comparisons is a fundamental process, with lots of practical and social applications, the ability to recognise this subtraction structure and the confidence to handle the associated language patterns are particularly important.

Life contexts:

How much money do I save if I send this letter second class?

Comparing holiday package prices.

Comparing the height or ages of siblings.

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_?

Early Years Foundation Stage - Early Learning Goal:

- Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
- Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.

Key skills for addition at Reception:

- Say a number one less than a number to 20.
- Use quantities or objects to subtract to single digit numbers.

Stages in Subtraction

Year 1

Children are encouraged to develop a mental picture of the number system in their heads to use for calculation. They develop ways of recording calculations using pictures etc. Children consolidate understanding of subtraction practically, showing subtraction on bead strings, using cubes etc. and in familiar contexts, and are introduced to more formal recording using number lines.

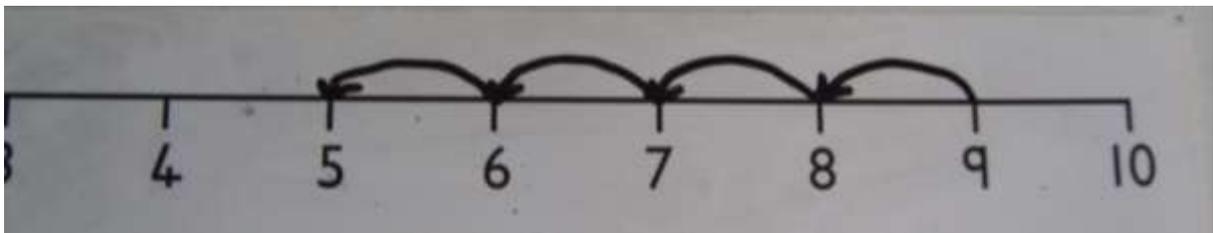
Counting back

For example: $9-5$

In your head:

Hold up 5 fingers, tap your head saying 9 then count back using your fingers for support 9(Head tap), 8, 7, 6, 5, 4.

❖ Using a number line

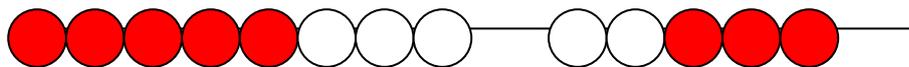


Ensure children are confident with using a marked number line before moving on to an empty number line (see year two guidance).

❖ Using a bead bar

Bead strings or bead bars can be used to illustrate subtraction including bridging through ten by counting back 3 then counting back 2.

$$13 - 5 = 8$$



❖ Using place value

Count back in ones/count back in tens, e.g. knowing $33 - 1$ or $33 - 10$

$$33 - 10 = 23$$

1	2	3	4	5	6
11	12	13	14	15	16
21	22	23	24	25	26
31	32	33	34	35	

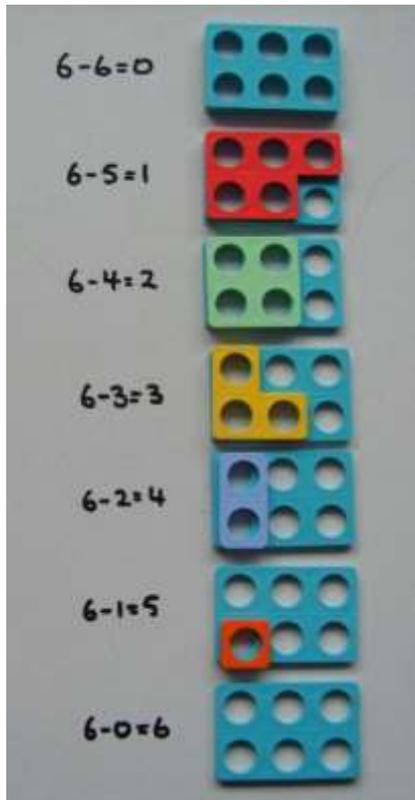
Stages in Subtraction

Using number facts

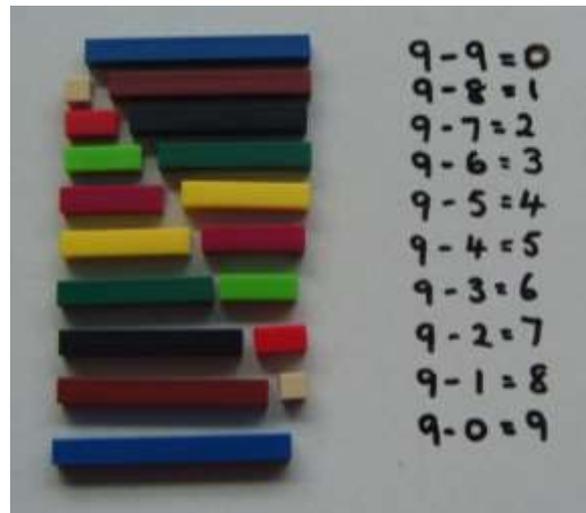
Using the 'Story' of 4, 5, 6, 7, 8 and 9.

❖ Using apparatus

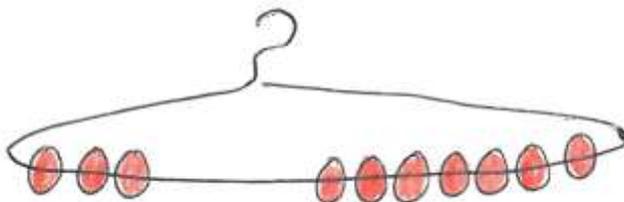
Numicon



Cuisenaire



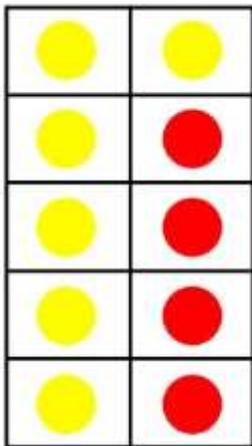
Number bonds to 10



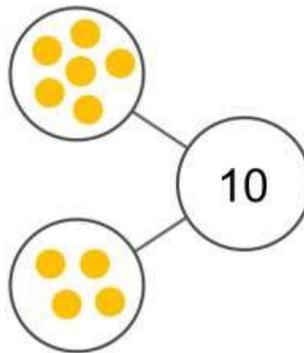
$$10 - 7 = 3 \text{ or } 3 = 10 - 7$$

Stages in Subtraction

Tens Frame



Part Whole Model



Bar Model

10	
6	4

$$6 + 4 = 10$$

$$4 + 6 = 10$$

$$10 - 6 = 4$$

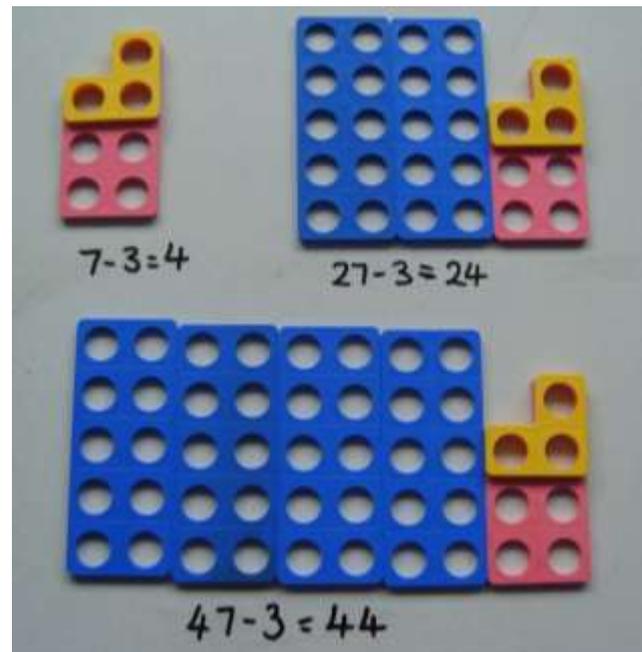
$$10 - 4 = 6$$

Connections between these models should be made, so that children understand the same mathematics is represented in different ways. Asking the question "What is the same what's different?" has the potential for children to draw out the connections.

Patterns using known facts

e.g $7 - 3 = 4$ so we also know $27 - 3 = 24$,

$47 - 3 = 44$, $87 - 3 = 84$



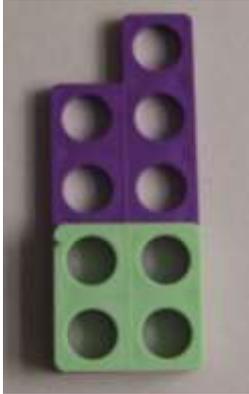
Inverse of addition structure

Refers to situations where we have to determine what must be added to a given quantity in order to reach some target. The phrase 'inverse of addition' underlines the idea that subtraction and addition are inverse processes.

Stages in Subtraction

Solve missing number problems

❖ Using apparatus



$$\text{eg } 9 - \square = 4$$

Using what is known, I have 9 and only 4 are left.
How many need to be added to 4 to have 9?



$$\text{Or } 7 = 10 - \square$$

❖ Using a number track

How many jumps to get from 4 to 10?



Key language to be developed:

What must be added? How many (much) more needed?

For example:

$28 + 52 = 80$ then $80 - 52$ must be 28. What must be added to X to give Y? We subtract X from Y. For example, the entrance fee is 80p, but I have only 52p, how much more do I need? On a numberline we start at 52 and determine what has to be added to get to 80.

This is a particularly important structure to draw on when doing subtraction calculations by mental and informal strategies.

Stages in Subtraction

Contextualise the mathematics:

There were 14 people on the bus, and 8 is the number who got off. How many are now on the bus?

Saving for something - I have £3 but I need £5, how much more do I need?

Pictorially - notice how each activity varies. The children are asked to:

<p>Before then now</p>  <p>Write the number sentence that matches this story</p> <p>Slide 1</p>	<p>Before then now</p>  <p>Draw the middle picture and Write the number sentence that matches this story</p> <p>Slide 2</p>
<p>Before then now</p>  <p>$4 - 0 = 4$</p> <p>Slide 3</p>	<p>Before then now</p>  <p>Finish the story and write the number sentence</p> <p>Slide 4</p>

Slide 1: Start with the story (concrete) and write the number sentence (abstract).

Slide 2: Start with the story (concrete) and complete it. Then write the number sentence (abstract).

Slide 3: Start with the number sentence (abstract) and complete the story (concrete).

Slide 4: Start with part of the story, complete two elements of it (concrete with challenge) and then write the number sentence (abstract).

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_?

National Curriculum 2014 statements:

- Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.
- Represent and use number bonds and related subtraction facts within 20.
- Add and subtract one-digit and two-digit numbers to 20, including zero.
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 3$.

Key skills for subtraction at Year 1:

- Given a number, say one more or one less.
- Count to and over 100, forward and back, from any number.
- Represent and use subtraction facts to 20 and within 20.
- Subtract with one-digit and two-digit numbers to 20, including zero.
- Solve one-step problems that involve addition and subtraction, using concrete objects (ie bead string, objects, cubes) and pictures, and missing number problems.

Stages in Subtraction

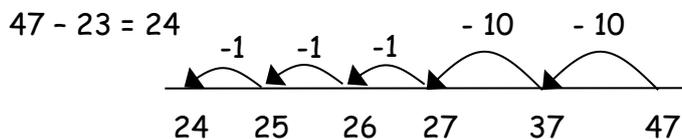
Year 2

Children will begin to use empty number lines to support calculations. They subtract on a number line by **counting back** aiming to develop mental subtraction skills. Children continue to use a range of apparatus to practise key skills and provide mathematical images to enable efficient mental calculations.

Counting back

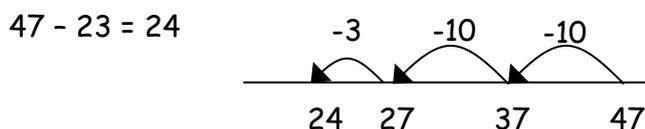
First counting back in tens and ones.

❖ Using an empty number line

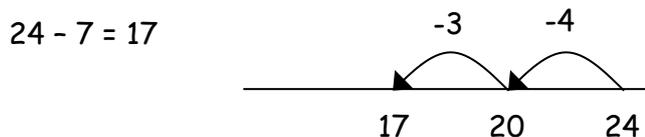


❖ Using an empty number line and number facts

Then helping children to become more efficient by subtracting the units in one jump (by using the known fact $7 - 3 = 4$).

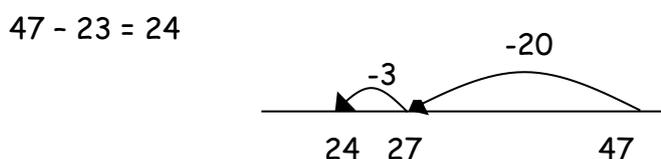


Also, knowing the fact $7 = 4 + 3$, subtract 7 from 24.



❖ Using an empty number line and place value

Followed by subtracting the tens in one jump and the units in one jump.



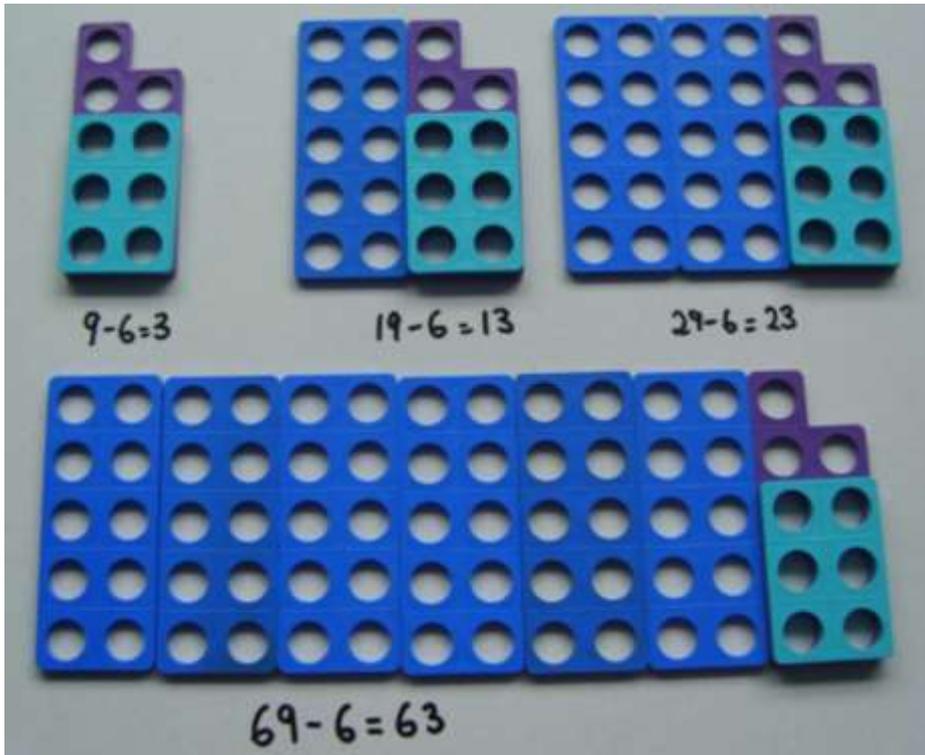
Stages in Subtraction

Using number facts

❖ Know pairs of numbers which make the numbers up to and including 20,
e.g. $10 - 6 = 4$, $15 - 4 = 11$, $20 - 11 = 9$.

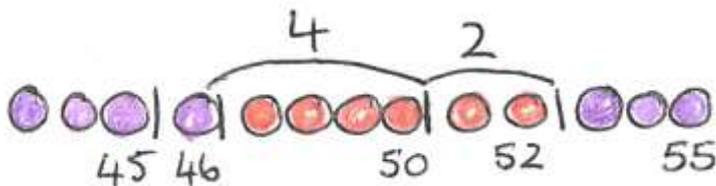
❖ Patterns of known facts,

e.g. $9 - 6 = 3$, so we know $19 - 6 = 13$, $29 - 6 = 23$, $39 - 6 = 33$, $69 - 6 = 63$.



❖ Bridging ten, using a bead bar or bead strings

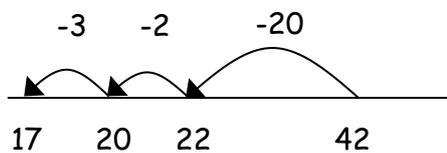
e.g. $57 + 5 = 65$ as 57 add 3 then add 2 more



❖ Bridging ten, using an empty number line

Bridging through ten can help children become more efficient.

$$42 - 25 = 17$$

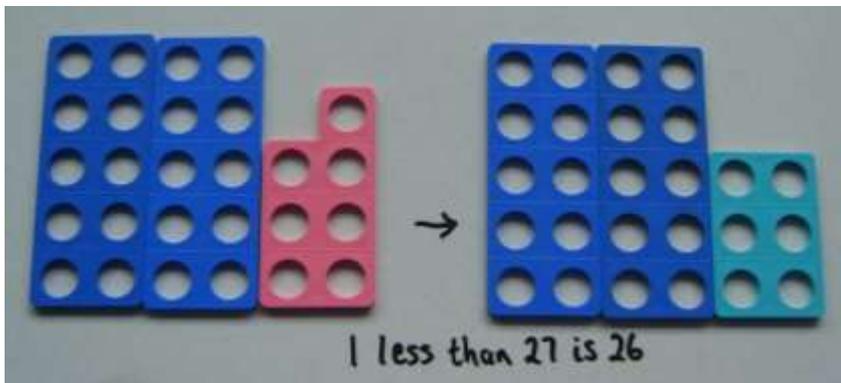


Stages in Subtraction

Using place value

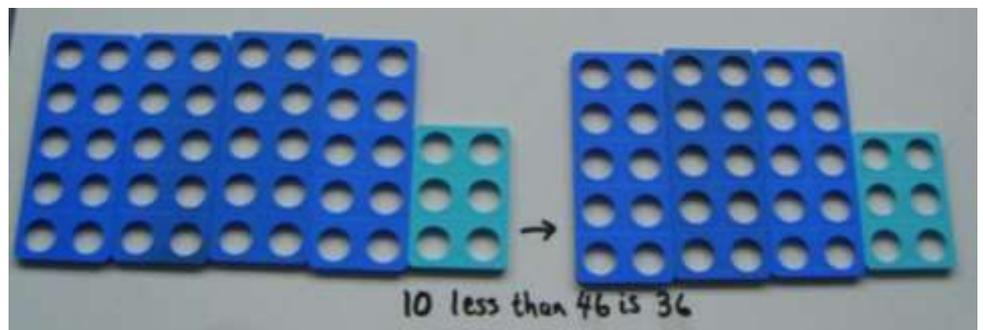
❖ Know 1 less or 10 less than any number

e.g. 1 less than 27 is 26 or 10 less than 46 is 36



0	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

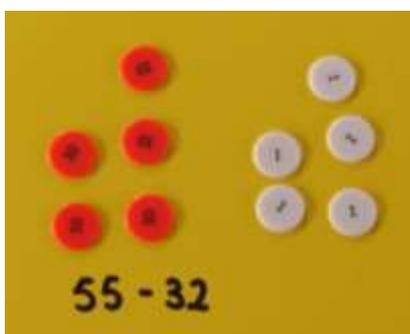
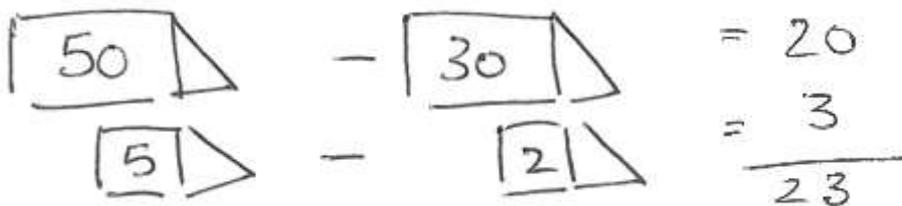
0	1	2	3	4	5	6	7	8	9
10	11	12	13	14	15	16	17	18	19
20	21	22	23	24	25	26	27	28	29
30	31	32	33	34	35	36	37	38	39
40	41	42	43	44	45	46	47	48	49
50	51	52	53	54	55	56	57	58	59
60	61	62	63	64	65	66	67	68	69
70	71	72	73	74	75	76	77	78	79
80	81	82	83	84	85	86	87	88	89
90	91	92	93	94	95	96	97	98	99



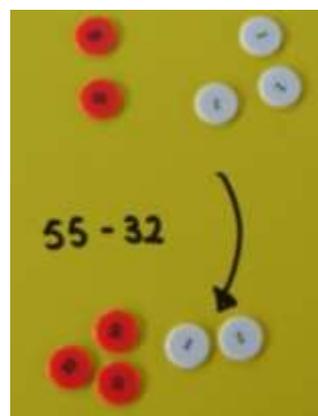
❖ Partitioning

e.g. $55 - 32$ as $50 - 30$ and $5 - 2$ finally combining the two answers: $20 + 3 = 23$

Arrow cards



Count out 55, then remove 32



leaves 23.

Stages in Subtraction

Counting back in tens, e.g

$$\begin{aligned}96 - 10 &= 86 \\86 - 10 &= 76 \\76 - 10 &= 66 \\66 - 10 &= 56 \\56 - 10 &= 46 \\46 - 10 &= 36 \\36 - 10 &= 26 \\26 - 10 &= 16 \\16 - 10 &= 6\end{aligned}$$


Children use and understand the layout of a hundred square in order to subtract 10 (10 less).

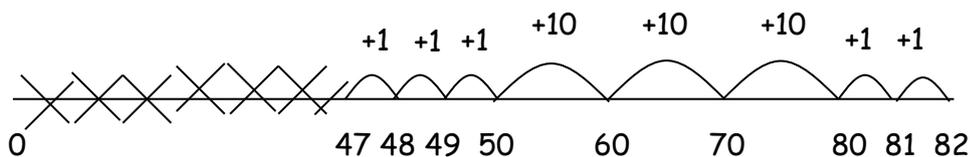
Counting up (inverse of addition - see Year 1)

If the numbers involved in the calculation are close together or near to multiples of 10, 100 etc, it can be more efficient to count on.

Count up from 47 to 82 in jumps of 10 and jumps of 1.

The number line should still show 0 so children can cross out the section from 0 to the smallest number. They then associate this method with 'taking away'.

82 - 47



Help children to become more efficient with counting on by:

Subtracting the units in one jump;

Subtracting the tens in one jump and the units in one jump;

Bridging through ten. (all described in the counting back section with number lines).

Stages in Subtraction

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units

National Curriculum 2014 statements:

- Solve problems with addition and subtraction:
 - Using concrete objects and pictorial representations, including those involving numbers, quantities and measures.
 - Applying their increasing knowledge of mental methods and written methods.
- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.
- Add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
 - a two-digit number and ones
 - a two-digit number and tens
 - two two-digit numbers
 - adding three one-digit numbers.
- Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Key skills for subtraction at Year 2:

- Recognise the place value of each digit in a two-digit number.
- Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100.
- Subtract using concrete objects, pictorial representations, 100 squares and mentally, including: a two-digit number and ones, a two-digit number and tens, and two two-digit numbers.
- Show that subtraction of one number from another cannot be done in any order.
- Recognise and use inverse relationship between addition and subtraction, using this to check calculations and missing number problems.
- Solve simple addition and subtraction problems including measures, using concrete objects, pictorial representation, and also applying their increasing knowledge of mental and written methods.
- Read and write numbers to at least 100 in numerals and in words.

Stages in Subtraction

Year 3

Children continue to use empty number lines with increasingly large numbers. Children will begin to use informal pencil and paper methods (jottings) to support, record and explain partial mental methods building on existing mental strategies. Children are introduced to the partitioned column subtraction method.

Counting back

- Taking away multiples of 10, 100 and £1.

e.g. $476 - 40 = 436$ (466, 456, 446, 436), $476 - 300 = 176$ (376, 276, 176), $£4.76 - £2 = £2.76$ (£3.76, £2.76)

- Count back in hundreds, tens then ones,

e.g. $763 - 121$ as $763 - 100$ (663) then subtract 20 (643) then subtract 1 (642)

- Subtract near multiples

e.g. $648 - 199$ as $648 - 200$ then add 1 back (449) or $86 - 39$ as $86 - 40$ then add 1 back (47).

Using number facts

- ❖ Know the number bonds to 100.

These can be worked out using a range of skills taught, the emphasis on calculating mentally and efficiently (each individual will have their own preferred method for each calculation).

- Using knowledge of the inverse operation:

e.g. $100 - 35 = 65$ (by using the inverse of $35 + 65 = 100$),

- Counting back in tens then ones:

e.g. $100 - 38 = 62$ (100 count back 3 tens, 90, 80, 70; count back 8 ones, 69, 68, 67, 66, 65, 64, 63, 62).

- Counting up in ones then tens:

e.g. $100 - 48 = 52$ (or counting up 48 to 50 is 2 and 50 more is 52).

- Combination of counting back and up:

e.g. $100 - 29 = 71$ (count back 3 tens, 90, 80, 70 and then "pay back 1", so 71).

Bar Model

247	
173	74

$$173 + 74 = 247$$

$$74 + 173 = 247$$

$$247 - 173 = 74$$

$$247 - 74 = 173$$

Stages in Subtraction

Using place value - Partitioning and decomposition

This process should be demonstrated using arrow cards to show the partitioning and base 10 materials to show the decomposition of number.

❖ Partitioning using arrow cards

e.g. $348 - 40 = 308$



NOTE When solving the calculation $89 - 57$, children should know that 57 does NOT EXIST AS AN AMOUNT it is what you are subtracting from the other number. Therefore, when using base 10 materials, children would need to count out only the 89.

Introduce **partitioned column subtraction** method.

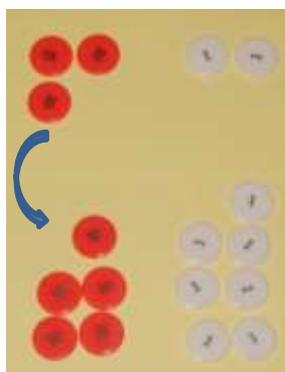
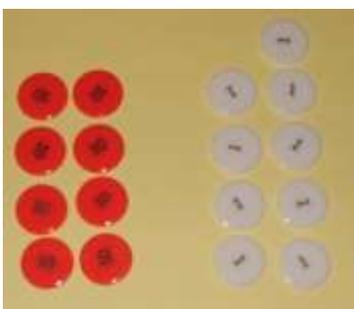
Initially, the children will be taught using examples that do not need the children to exchange.

❖ Partitioning using place value counters

e.g. $89 - 57 = 32$

$$\begin{array}{r} 89 \\ - 57 \\ \hline 32 \end{array} \quad \longrightarrow \quad \begin{array}{r} 80 + 9 \\ 50 + 7 \\ \hline 30 + 2 = 32 \end{array}$$

Count out 89 then remove 57



leaves 32.



From this the children will begin to exchange.

Stages in Subtraction

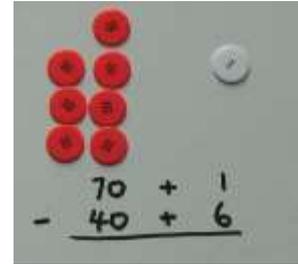
Subtraction with exchanging.

$$\begin{array}{r} 71 \\ - 46 \\ \hline \end{array} =$$

The calculation should be read as e.g. take 6 from 1.

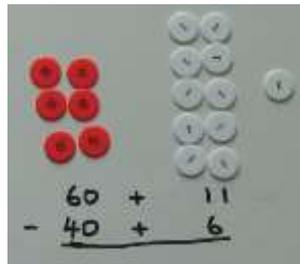
Step 1

$$\begin{array}{r} 70 + 1 \\ - 40 + 6 \\ \hline \end{array}$$



Step 2

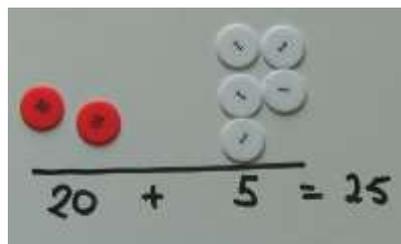
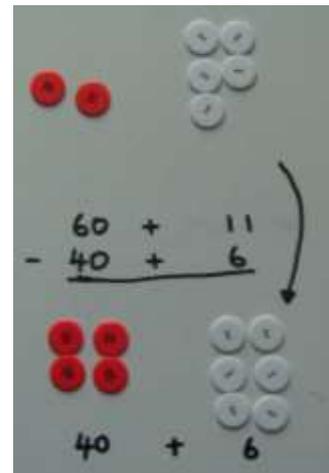
$$\begin{array}{r} 60 + 11 \\ - 40 + 6 \\ \hline 20 + 5 = 25 \end{array}$$



This would be recorded by the children as

$$\begin{array}{r} \cancel{60} + 11 \\ - 40 + 6 \\ \hline 20 + 5 = 25 \end{array}$$

Children should know that units line up under units, tens under tens, and so on.



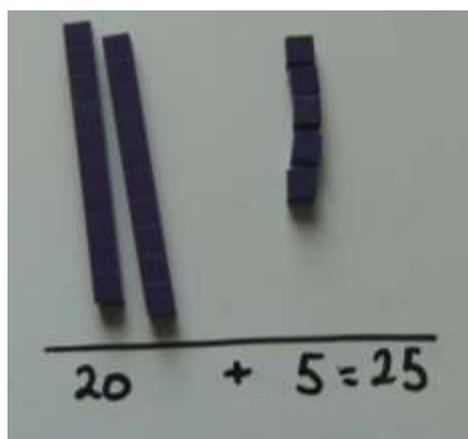
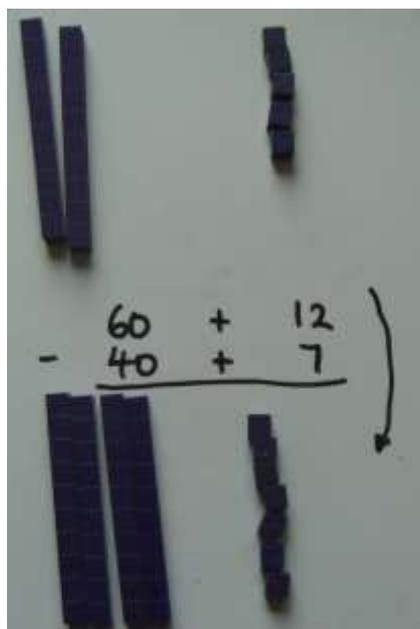
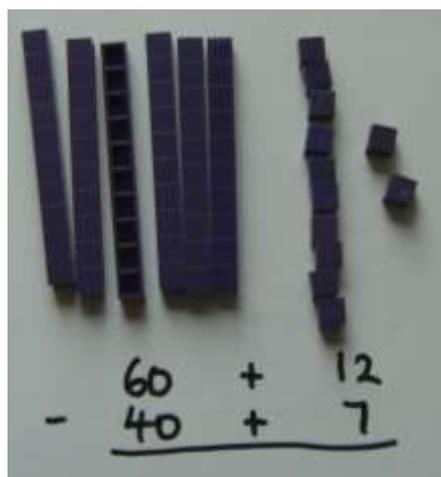
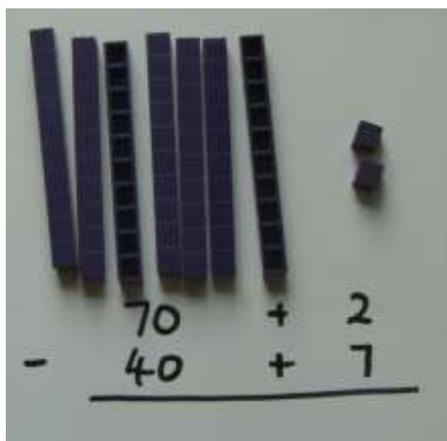
Stages in Subtraction

❖ Partitioning using Dienes (base 10 apparatus)

Introduce "exchanging" through practical subtraction. Make the larger number with Base 10, and then subtract 47 from it.

$$72 - 47 =$$

Before subtracting '7' from the 72 blocks, they will need to exchange a row of 10 for ten units. Then subtract 7, and subtract 4 tens.



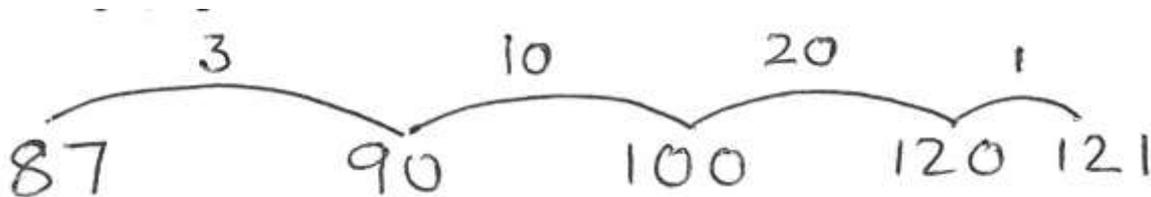
Stages in Subtraction

Once pupils are secure with the understanding of "exchanging", they can use the partitioned column method to subtract any 2 and 3-digit numbers.

	2	3	8	-	1	4	6	=	9	2
	2	0	0	+	1	3	0	+	8	
-	1	0	0	+	4	0	+	6		
			0	+	9	0	+	2		

Counting up

Find the difference between two numbers by counting up from the smaller to the larger, e.g. $121 - 87 = 3 + 10 + 20 + 1 = 34$



Continue to reinforce counting on as a strategy for **close-together numbers** (e.g. 121–118), and also for numbers that are "nearly" multiples of 10, 100, 1000 or £s, which make it easier to count on (e.g. 102-89, 131–79, or calculating change from £1 etc.).

Contextualise the mathematics:

Many are in the context of sport. If I have scored 180 in darts how many more do I need to reach 501?

Cricket - chasing a score of 432 runs and we only have 235, how many more do we need?

Travelling - The car journey is 74 miles and so far we have travelled 61 miles, how much further to go?

Stages in Subtraction

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units, exchange, decrease, hundreds, value, digit

National Curriculum 2014 statements:

- Add and subtract numbers mentally, including:
 - a three-digit number and ones
 - a three-digit number and tens
 - a three-digit number and hundreds
- Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
- Estimate the answer to a calculation and use inverse operations to check answers
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.

Key skills for subtraction at Year 3:

- Subtract mentally a: 3-digit number and ones, 3-digit number and tens, 3-digit number and hundreds.
- Estimate answers and use inverse operations to check.
- Solve problems, including missing number problems.
- Find 10 or 100 more or less than a given number.
- Recognise the place value of each digit in a 3-digit number.
- Counting up differences as a mental strategy when numbers are close together or near multiples of 10 (see examples above)
- Read and write numbers up to 1000 in numerals and words.
- Practise mental subtraction strategies, such as subtracting near multiples of 10 and adjusting (e.g. subtracting 19 or 21), and select most appropriate methods to subtract, explaining why.

Stages in Subtraction

Year 4

Children continue to use partitioned column subtraction with 'exchanging' (decomposition) as introduced in Year 3, but moving towards more complex numbers and values. Place value counters and other base 10 apparatus are used to reinforce "exchanging". When children are confident and efficient with partitioned column subtraction they are taught compact column subtraction.

Counting back

Taking away multiples of 10, 100, 1000 and £1, 10p or 0.1.

e.g. $8392 - 50 = 8342$, $6723 - 3000 = 3723$, $£3.74 - 30p = £3.44$, $5.6 - 0.2 = 5.4$

Count back in thousands, hundreds, tens then ones,

e.g. $6482 - 1301$ as $6482 - 1001$ (5482) then subtract 300 (5182) then subtract 1 (5181)

Subtract near multiples

e.g. $3522 - 1999$ as $3522 - 2000$ then add 1 back (1523) or $£34.86 - £19.99$ as $£34.86 - £20$ then add 1p back (£14.87).

Using number facts

❖ Know the number bonds to 1, 10, 100 and derived facts.

e.g. $100 - 76 = 34$, $1.0 - 0.6 = 0.4$, etc

❖ Know the number bonds to £1 and £10.

e.g. $£1.00 - 86p = 14p$ or $£10 - £3.40 = £6.60$

Using place value

Using place value to subtract, e.g. $4748 - 4000 = 748$ or $4748 - 8 = 4740$

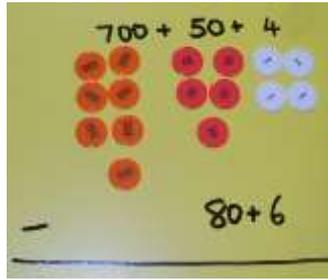
Stages in Subtraction

Using place value - Partitioning and decomposition

$$\begin{array}{r} 754 \\ - 86 \\ \hline \end{array}$$

Step 1

$$\begin{array}{r} 700 + 50 + 4 \\ - \quad \quad 80 + 6 \\ \hline \end{array}$$

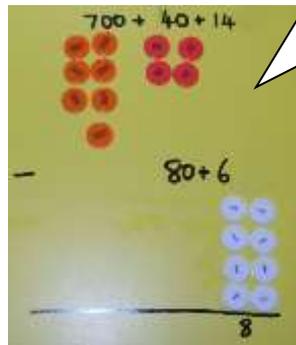
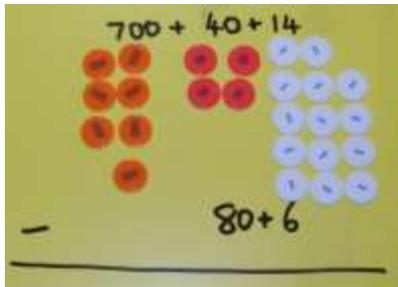


Now it is possible to calculate the units: 14 subtract 6 is 8.

Step 2

$$\begin{array}{r} 700 + 40 + 14 \\ - \quad \quad 80 + 6 \\ \hline \end{array}$$

(adjust from T to U)

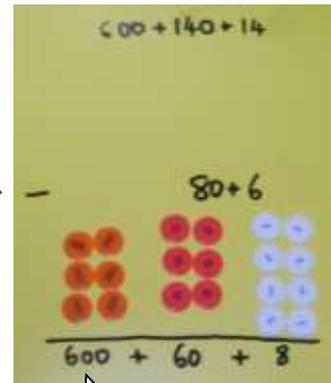
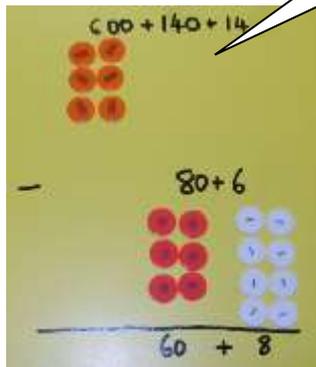
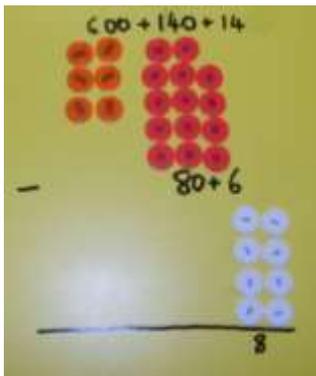


Now calculate the tens: 140 subtract 80 is 60.

Step 3

$$\begin{array}{r} 600 + 140 + 14 \\ - \quad \quad 80 + 6 \\ \hline 600 + 60 + 8 = 668 \end{array}$$

(adjust from H to T)



This would be recorded by the children as

$$\begin{array}{r} \overset{600}{\cancel{700}} + \overset{140}{\cancel{50}} + 14 \\ - \quad \quad 80 + 6 \\ \hline 600 + 60 + 8 = 668 \end{array}$$

By Carole Shilston – Maths Subject Leader

Lastly, calculate the hundreds: 600 subtract zero hundreds is 600.

Stages in Subtraction

2	7	5	4	-	1	5	6	2	=	1	1	9	2
2	0	0	0	+	7	0	0	+	5	0		4	
-	1	0	0	+	5	0	0	+	6	0		2	
	1	0	0	+	1	0	0	+	9	0		2	

	2	7	5	4
-	1	5	6	2
	1	1	9	2

To introduce the compact method, ask children to perform a subtraction calculation with the familiar partitioned column subtraction then display the compact version for the calculation they have done. Ask pupils to consider how it relates to the method they know, what is similar and what is different, to develop an understanding of it

Counting up

Find the difference between two numbers by counting up from the smaller to the larger, e.g. $506 - 387 = 106 + 10 + 3 = 119$



Stages in Subtraction

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_? , difference, count on, strategy, partition, tens, units, exchange, decrease, hundreds, value, digit, inverse

National Curriculum 2014 statements:

- Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.
- Estimate and use inverse operations to check answers to a calculation.
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

Key skills for subtraction at Year 4:

- Subtract by counting on where numbers are close together or they are near to multiples of 10, 100 etc.
- Children select the most appropriate and efficient methods for given subtraction calculations.
- Estimate and use inverse operations to check answers.
- Solve addition and subtraction 2-step problems, choosing which operations and methods to use and why.
- Solve simple measure and money problems involving fractions and decimals to two decimal places.
- Find 1000 more or less than a given number.
- Count backwards through zero, including negative numbers.
- Recognise place value of each digit in a 4-digit number Round any number to the nearest 10, 100 or 1000
- Solve number and practical problems that involve the above, with increasingly large positive numbers.

Stages in Subtraction

Year 5

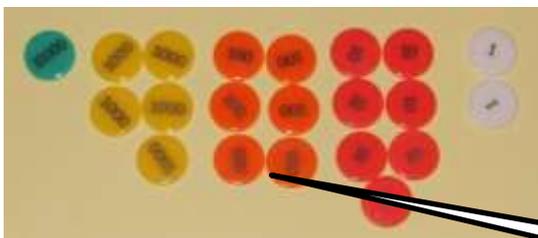
Children continue to use partitioning and decomposition becoming more competent in moving from using expanded column subtraction to the compact method. Children subtract numbers with more than 4 digits and are introduced to numbers with two decimal places, including measures and money.

Counting back

Taking away multiples of powers of 10.

e.g. $15,672 - 300 = 15,372$; $4.82 - 2 = 2.82$; $6.26 - 0.2 = 6.06$; $4.68 - 0.02 = 4.66$.

TTh	Th	H	T	U
1	5	6	7	2



Where:

TTh	Ten Thousands	Th	Thousands
H	Hundreds	T	Tens
U	Units/Ones		

Having this image in their head, children can count back in hundreds

15,572; 15472; 15,372.

Partition or count back in multiples of power of 10.

e.g. $3964 - 1051$ as $3964 - 1000$ (2964) then subtract 50 (2914) then subtract 1 (2913)

Subtract near multiples

e.g. $86,456 - 9999$ as $86,456 - 10,000$ then add 1 back (76,457) or $3.58 - 1.99$ as $3.58 - 2$ then add 0.1 back (1.59).

Using number facts

❖ Know the number bonds to 10 and 100 and derived facts.

e.g. $2 - 0.45 = 1.55$ using $45 + 55 = 100$ or $3.00 - 0.86 = 2.14$ using $86 + 14 = 100$

❖ Know the number bonds to £1, £10 and £100.

e.g. $£4.00 - £3.86p = 14p$ or $£100 - £66 = £34$ using $66 + 34 = 100$.

Bar Model

6.2	
3.4	2.8

$$3.4 + 2.8 = 6.2$$

$$2.8 + 3.4 = 6.2$$

$$6.2 - 3.4 = 2.8$$

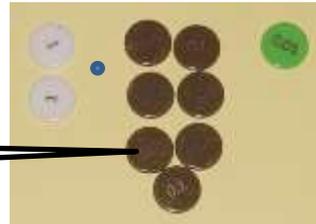
$$6.2 - 2.8 = 3.4$$

Stages in Subtraction

Using place value

Using place value to subtract decimals,
e.g. $4.58 - 0.08 = 4.50$ or $2.71 - 0.5 = 2.21$

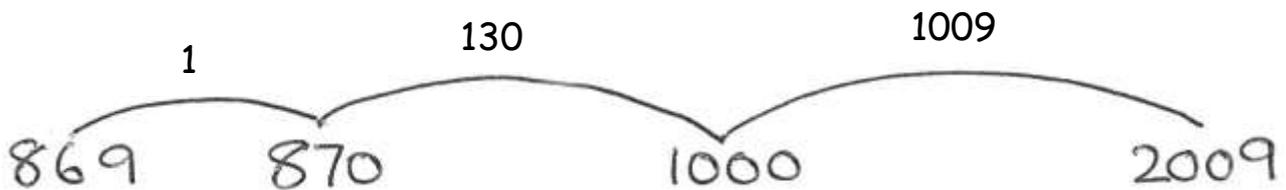
Units	Tenths	Hundredths
2	7	1



Remove 5 tenths

Counting up

Find a difference between two numbers by counting up from the smaller to the larger,
e.g. $2009 - 869 = 1009 + 130 + 1 = 1040$



Find change using 'shopkeepers' addition.

e.g. buy a toy for £6.89 using a £10 note - give back 11p and £3 in change.



Written subtraction

Children who are still not secure with number facts and place value will need to remain on the partitioned column method until ready for the compact method.

Subtracting with larger integers:

	2	8	0	8	6
-		2	1	2	8
	2	8	9	2	8

Stages in Subtraction

Subtract with decimal values, including mixtures of integers and decimals, aligning the decimal point.

$$\begin{array}{r} \overset{6}{7} \overset{10}{\cancel{6}} \overset{8}{9} \overset{1}{\cancel{0}} \cdot \overset{0}{0} \\ - \quad \quad 372 \cdot 5 \\ \hline 6796 \cdot 5 \end{array}$$

At a 'zero' in any empty decimal places to aid understanding of what to subtract in that column.

Create lots of opportunities for subtracting and finding differences with money and measures.

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units, exchange, decrease, hundreds, value, digit, inverse, tenths, hundredths, decimal point, decimal

National Curriculum 2014 statements:

- Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).
- Add and subtract numbers mentally with increasingly large numbers.
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Key skills for subtraction at Year 5:

- Subtract numbers mentally with increasingly large numbers.
- Use rounding and estimation to check answers to calculations and determine, in a range of contexts, levels of accuracy.
- Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 million.
- Interpret negative numbers in context, counting forwards and backwards with positive and negative integers through 0.
- Round any number up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.

Stages in Subtraction

Year 6

Children become more competent in using the compact method of subtraction. They subtract with increasingly large and more complex numbers and decimal values, including measures and money.

At this stage children should be able to apply their knowledge of a range of mental strategies, mental recall skills, and informal and formal written methods when selecting **the most appropriate method** to work out subtraction problems.

Counting back

Taking away multiples of powers of 10.

e.g. $132,956 - 400 = 132,556$; $686,109 - 40,000 = 646,109$; $7.823 - 0.5 = 7.323$.

Partition or count back in multiples of power of 10.

e.g. $3964 - 1051$ as $3964 - 1000$ (2964) then subtract 50 (2914) then subtract 1 (2913) or $5.72 - 2.10$ as $5.72 - 2$ (3.72) then subtract 0.1 (3.62).

Subtract near multiples

e.g. $360,078 - 99,998$ as $360,078 - 100,000$ then add 2 back (260,080) or $12.831 - 0.99$ as $12.831 - 1$ then add 0.1 back (11.832).

Using number facts

❖ Know the number bonds to 10 and 100 and derived facts.

e.g. $0.1 - 0.075 = 0.025$ using $75 + 25 = 100$ or $5 - 0.65 = 4.35$ using $65 + 35 = 100$



❖ Know the number bonds to £1, £10 and £100.

e.g. $£7.00 - £4.37 = £2.63$ using $37p + 63p = £1$ and $£5 + £2 = £7$ or $£100 - £66.20 = £33.80$ using $20p + 80p = £1$ and $£67 + £33 = £100$

Stages in Subtraction

Using place value

Using place value to subtract decimals, e.g. $7.782 - 0.08 = 7.702$ or $16.263 - 0.2 = 16.063$

Using the compact column method to subtract more complex integers.

$$\begin{array}{r}
 \cancel{7} \cancel{8} \cancel{10}, 699 \\
 - \quad 89,949 \\
 \hline
 60,750
 \end{array}$$

Using the compact column method to subtract money and measures, including decimals with different numbers of decimal places.

$$\begin{array}{r}
 \cancel{7} \cancel{10} 15 \cdot \cancel{4} 19 \text{ kg} \\
 - \quad 36 \cdot 08 \text{ kg} \\
 \hline
 69 \cdot 339 \text{ kg}
 \end{array}$$

Empty decimal places can be filled with **zero** to show the place value in each column

Counting up

Count up to subtract numbers from multiples of 10, 100, 1000 and 10,000. Find a difference between two decimal numbers by counting up from the smaller to the larger.

e.g. $1.2 - 0.87 = 0.03 + 0.1 + 0.2$



Stages in Subtraction

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units, exchange, decrease, hundreds, value, digit, inverse, tenths, hundredths, decimal point, decimal

National Curriculum 2014 statements:

- Perform mental calculations, including with mixed operations and large numbers.
- Use their knowledge of the order of operations to carry out calculations involving the four operations.
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Key skills for subtraction at Year 6:

- Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
- Read, write, order and compare numbers up to 10 million and determine the value of each digit
- Round any whole number to a required degree of accuracy
- Use negative numbers in context, and calculate intervals across zero.
- Children need to utilise and consider a range of mental subtraction strategies, jottings and written methods before choosing how to calculate.