



WILLIAM BOOTH
PRIMARY & NURSERY SCHOOL



Calculation policy for subtraction

Y1

Revisit

count up to 20
place numbers in order
count objects accurately
know one more and one less up to 20
subtract a 1-digit number from a 1-digit number

NC objectives

Pupils should be taught to:

- read, write and interpret mathematical statements involving subtraction ($-$) and equals ($=$) signs
- represent and use number bonds and related subtraction facts within 20
- subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 =$

Resources

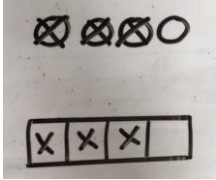


NC Objective: Subtract one-digit and two-digit numbers to 20, including zero

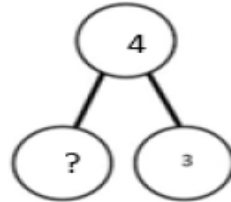
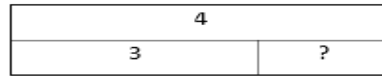
Small Step: How many left - numbers up to 10

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations



Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used.



Misconceptions

Not realising that numbers can be counted in order forwards and backwards.



Physically taking away and removing objects from a whole (ten frames, Numicon, cubes and other items such as beanbags could be used).

$$4 - 3 =$$

$$\square = 4 - 3$$

NC Objective: Subtract one-digit and two-digit numbers to 20, including zero

Small Step: Counting back – numbers up to 10

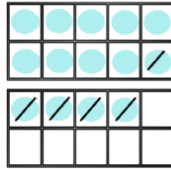
Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Counting back



Abstract
 $8 - 5 = 3$



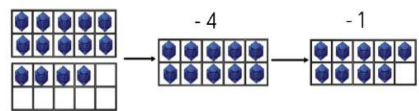
Children to present the ten frame pictorially and discuss what they did to make 10.

Counting back (using number lines or number tracks) children start with 6 and count back 2.



Misconceptions

Not realising that numbers can be counted in order forwards and backwards.



Making 10 using ten frames.
 $14 - 5$



Counting back continuing to partition the subtrahend

$$\begin{array}{r} 14 - 5 = 9 \\ \swarrow \quad \searrow \\ 4 \quad \quad 1 \end{array}$$

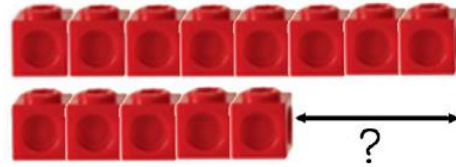
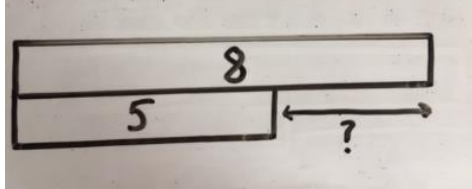
$$\begin{array}{l} 14 - 4 = 10 \\ 10 - 1 = 9 \end{array}$$

NC Objective: Subtract one-digit and two-digit numbers to 20, including zero

Small Step: Finding the difference – numbers up to 10

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

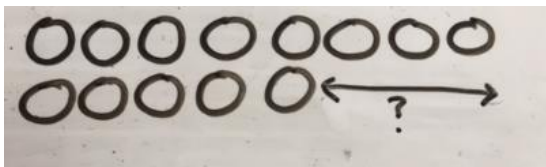
Representations



Finding the difference (using cubes, Numicon etc - other objects can also be used). Calculate the difference between 8 and 5.

Misconceptions

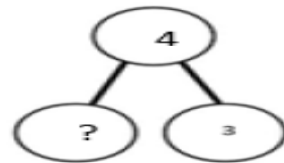
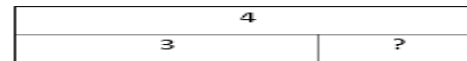
Pupils might not understand the concept of 'finding a difference'. This is largely due to the fact that they can count on or back and are unsure which method to choose.



Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate.

$$4 - 3 =$$


$$= 4 - 3$$



Y2

Revisit

NC objectives

Children should be able to:
know TO place value of numbers
subtract a 1-digit number from another from and within 20

Pupils should be taught to:

- solve problems with subtraction:
using concrete objects and pictorial representations, including those involving numbers, quantities and measures
applying their increasing knowledge of mental and written methods
- recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100
- 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

Resources

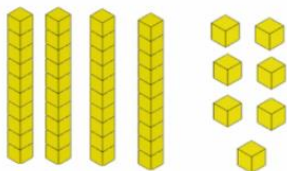


- **NC Objective:** solve problems with subtraction:
using concrete objects and pictorial representations, including those involving numbers, quantities and measures
applying their increasing knowledge of mental and written methods
- recall and use subtraction facts to 20 fluently

Small Step: 10 less

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations



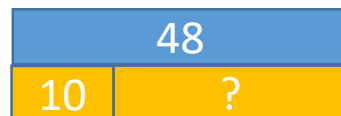
Use base 10 to physically take away

Use base 10 picture to cross out correct amount

Misconceptions

Subtractions involving zeros cannot be done

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



Abstract
 $48 - 10 = 38$

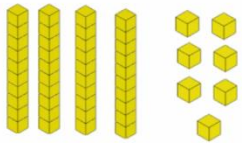
NC Objective: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods

Small Step: Subtract multiple of 10

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Use base 10 to physically take away



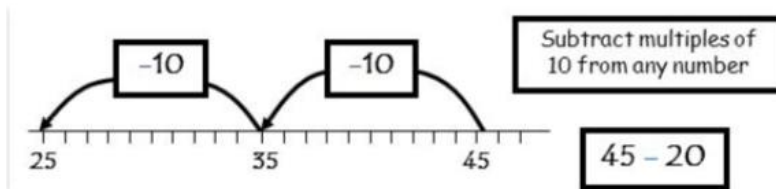
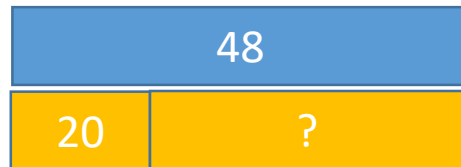
Abstract
 $48 - 20 = 28$

Misconceptions

Pupils not understanding the value of each digit in a number

Lack of place value knowledge may mean children don't spot the connection between 8-3 and 80-30

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



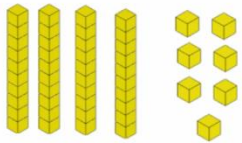
NC Objective: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods

Small Step: TO – O no exchanging

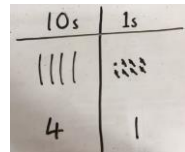
Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Use base 10 to physically take away



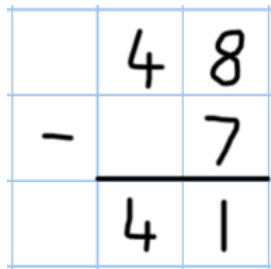
Use base 10 picture to cross out correct amount



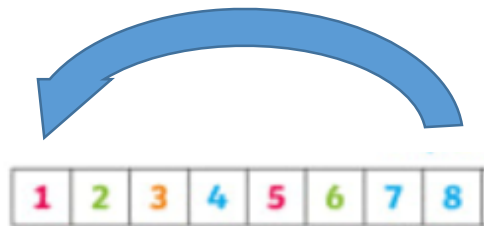
Misconceptions

Pupils sometimes begin subtracting with the left hand column first

May not put larger numbers on top in column subtraction



Use number line to make link between 8-7 and 18-7, 28-7 etc



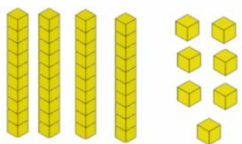
NC Objective: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods

Small Step: TO – TO no exchanging

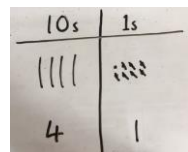
Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Use base 10 to physically take away



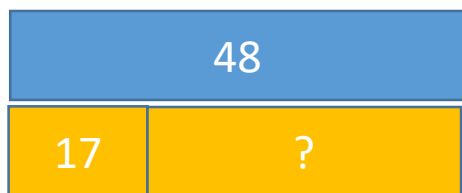
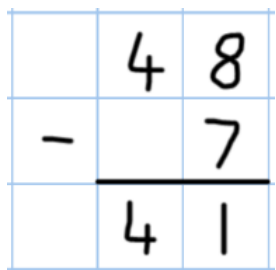
Use base 10 picture to cross out correct amount



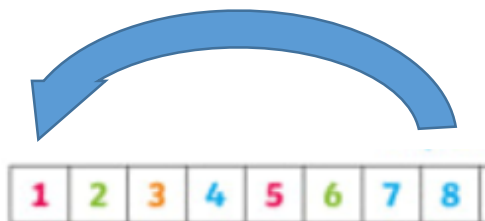
Misconceptions

Pupils sometimes begin subtracting with the left hand column first

Use of inaccurate language, e.g. must use exchange instead of borrow



Use number line to make link between 8-7 and 18-7, 28-17 etc



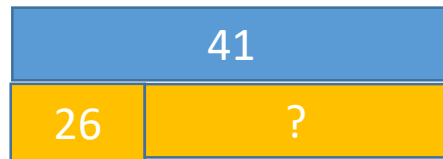
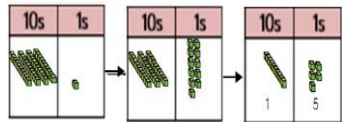
NC Objective: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods

Small Step: TO – TO exchanging

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

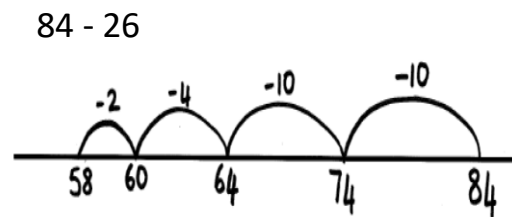
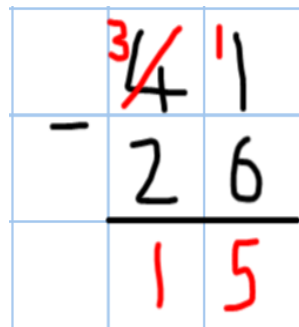
$41 - 26 = 15$ using base ten and regrouping



Misconceptions

In tens and units and other formal vertical subtraction calculations, children sometimes take the smaller unit number from the larger, regardless of whether it is part of the larger or smaller number.

e.g. $45 -$
 $\begin{array}{r} 37 \\ 12 \end{array}$



Use of inaccurate mathematical language, e.g. must use exchange instead of borrow

Y3

Revisit

NC objectives

Children should be able to:
understand TO place value of numbers
mentally subtract a multiple of 10
use formal column subtraction including exchanging for TO - TO

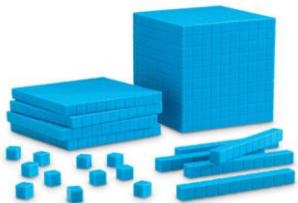
Subtract numbers mentally, including:
a three-digit number and ones
a three-digit number and tens
a three-digit number and hundreds

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 subtraction.

Resources



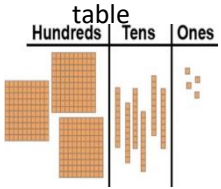
NC Objective: Subtract numbers mentally, including:
a three-digit number and ones, tens and hundreds

Small Step: Subtract 100 less

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Use base 10 to physically
take away, setting out in PV



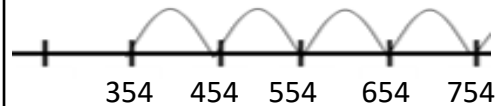
Children draw their
own PV table and
counters to represent
the number before
crossing out as
appropriate

Misconceptions

Pupils not understanding the value of each digit in a number

PV counters set out table
 $234 - 100 = 134$

100s	10s	1s



Continue to make use of
blank number lines and
reinforce PV
 $754 - 400$ or $754 - 300$

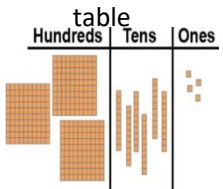
NC Objective: Subtract numbers mentally, including:
a three-digit number and ones, tens and hundreds

Small Step: Subtract Multiples of 100

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Use base 10 to physically
take away, setting out in PV

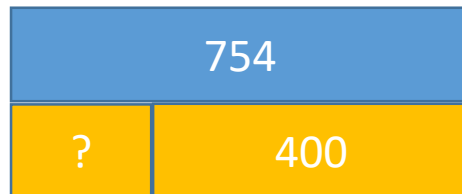


Children draw their
own PV table and
counters to represent
the number before
crossing out as
appropriate

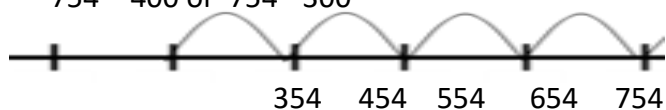
Misconceptions

Pupils not understanding the value of each digit in a number

PV counters set
out table
 $248 - 200 = 48$



Continue to make use of blank number
lines and reinforce PV
 $754 - 400$ or $754 - 300$



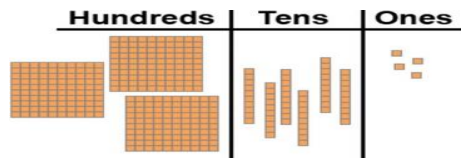
NC Objective: Subtract numbers with up to three digits, using formal written methods of column subtraction

Small Step: Subtract without exchanging

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Use base 10 to physically take away, setting out in PV table



PV counters set out table
 $234 - 133 = 101$

100s	10s	1s
● ●	● ● ● ● ● ● ● ●	● ● ● ● ● ● ● ● ● ●

$$\begin{array}{r} 763 \\ -251 \\ \hline 512 \end{array}$$

$$\begin{array}{r} 700 + 60 + 3 \\ - 200 + 50 + 1 \end{array}$$

Misconceptions

Pupils sometimes begin subtracting with the left hand column first

Misconceptions occur when pupils (and teachers) use inaccurate language.

e.g. $27 - 15$

When talking about $20 - 10$ they may refer to it as $2 - 1$

NC Objective: Subtract numbers with up to three digits, using formal written methods of column subtraction

Small Step: Subtract with exchanging

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

$$\begin{array}{r}
 \text{H} \quad \text{T} \quad \text{O} \\
 182 \\
 - 37 \\
 \hline
 145
 \end{array}$$

$$\begin{array}{r}
 700 + 50 + 2 \\
 - 300 + 10 + 8 \\
 \hline
 400 + 30 + 4 = 434
 \end{array}$$

Misconceptions

Pupils sometimes begin subtracting with the left hand column first

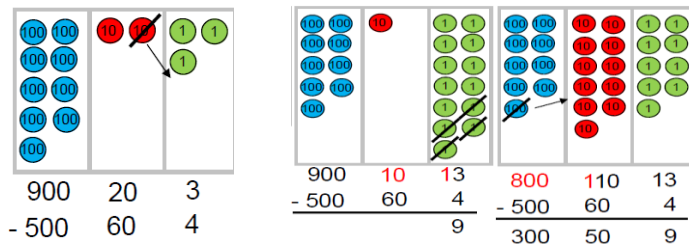
Misconceptions occur when pupils (and teachers) use inaccurate language.

e.g. 27 -

15

When talking about 20 - 10 they may refer to it as 2 - 1

Use physical PV counters and base ten and pictures of both to represent subtraction



Use base 10 to physically take away, setting out in PV table, exchanging where necessary

Y4

Revisit

NC objectives

Children should be able to:

Understand place value of numbers

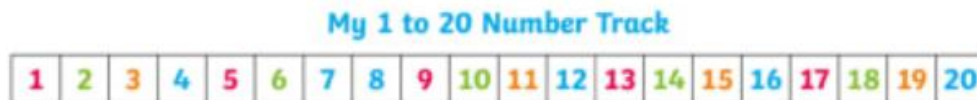
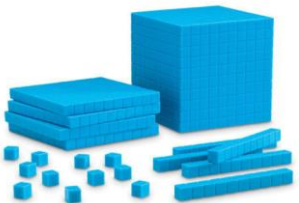
Use formal column subtraction including exchanging for HTO - HTO

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.

Resources



NC Objective: subtract numbers with up to 4 digits mentally

Small Step: Subtract 1000 less

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

Use PV counters to physically take away, setting out in PV table
2513 - 1000

Th	H	T	O
●	●	●	●
●	●		●
	●		●
	●		
	●		

Children draw their own PV table and counters to represent the number before crossing out as appropriate

Misconceptions

- Pupils not understanding the value of each digit in a number

2513

1000

?

2513
-1000

NC Objective: subtract numbers with up to 4 digits mentally

Small Step: Subtract Multiples of 1000

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

PV counters set out
table $7141 - 3000 = ?$

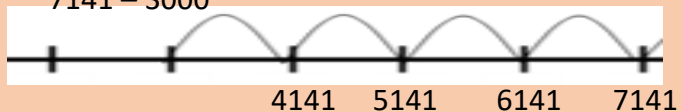
Th	H	T	O
●	●	●	●
●	●		●
	●		●
	●		
	●		

Children draw their
own PV table and
counters to represent
the number before
crossing out as
appropriate

7141	
?	3000

Continue to make use of blank number
lines and reinforce PV

$7141 - 3000$



Misconceptions

Pupils not understanding the value of each digit in a number

NC Objective: subtract numbers with up to 4 digits using the formal written methods of column subtraction where appropriate

Small Step: Subtract without exchanging

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations

PV counters set out table and remove counters
 $2513 - 1402$

Th	H	T	O
●	●	●	●
●	●		●
	●		●
	●		
	●		

Use picture of base 10 and PV counters
 $3257 - 1123$

$$\begin{array}{r} 3763 \\ - 1251 \\ \hline \end{array}$$

$$\begin{array}{r} 3000 + 700 + 60 + 3 \\ - 1000 + 200 + 50 + 1 \end{array}$$

Misconceptions

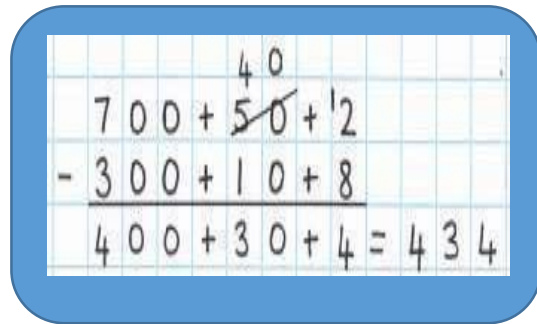
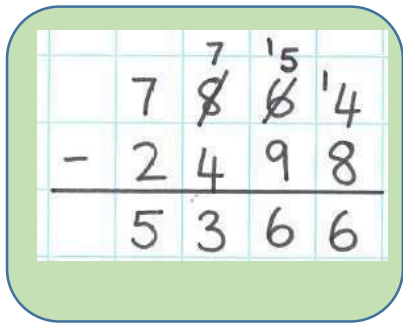
- Children line up the numbers incorrectly due to misconceptions around place value
- Children don't see the calculation as a whole which will lead to further misconceptions when exchanging is involved

NC Objective: subtract numbers with up to 4 digits using the formal written methods of column subtraction where appropriate

Small Step: Subtract with exchanging

Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease

Representations



Use physical PV counters and base ten, exchanging where necessary

Children draw their own PV table and counters to represent the number before crossing out as appropriate

Misconceptions

- Pupils may subtract the smaller digit in a column from the larger digit, regardless of which appears in the top line. This can arise if they hear that, “for subtraction you always start with the bigger number and subtract the smaller number”.
- Not understanding the role of 0 as a place holder so when face with 0-7 they answer 0

Y5 and 6

Children in Year 5 and 6 should continue to develop their mental and written calculation methods for subtraction. They should progress to larger numbers and continue calculating with decimals, including those with different numbers of decimal places.

Please see the Year 4 (or earlier) calculation policy for more information about the written strategies for subtraction they should use.