

Subtraction

Key Language:

Nursery

Development matters

Resources

-
-

Concrete

Pictorial

Abstract

Conceptual variation:

Subtraction

Key Language: Subtract, take away, less, smaller, part, whole, less than, number line, number track

Reception

ELG

- Automatically recall (without reference to rhymes, counting or other aides) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Resources

- Objects for counting
- Fives/tens frames
- Picture cards-different representations of number
- Number line/track

Concrete

Find one less than a given number between 10

Count the whole and then take away one at a time to show that the number is becoming one less than it was.

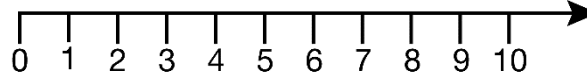


Pictorial

Use a five frame to show a given number. Remove one object/counter to show the number becoming one less than the number before.

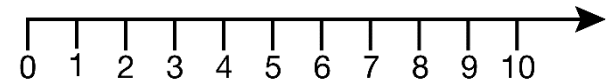
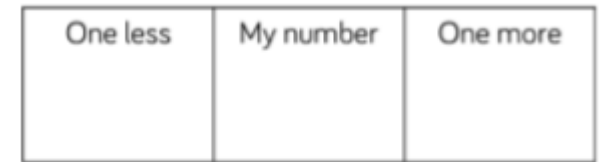


Use the number line to consolidate understanding of the number getting smaller.



Abstract

Children to use a number line to show one step back means one less.



Introducing 0

Children to see objects being taken away to show nothing- what is the number that is left over?



Children to represent the number 0 using different representations and make the correspondence to the number.



Use the songs and stories suggested to role play the story with the children e.g. Five currant buns.



How many buns are there altogether? Put the penny in the pot, how many pennies do we have? How many buns do we have now? Repeat the song and questions highlighting there is one less bun each time, but one more penny.

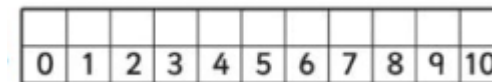
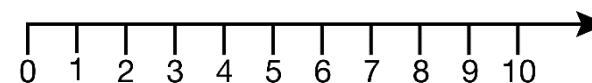
Taking away by counting back
Children to count out a set of objects. Then children should take away an amount from the whole they counted.



Use tens frames to represent taking away objects.



Get children to start at the biggest number and count back/jump back using a counter.

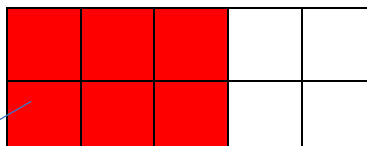


Conceptual variation:



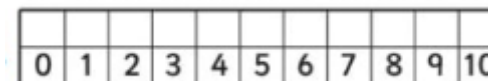
Children to remove the amount of dinosaurs that they have been asked to take away from the whole.

Children to use a tens frame to create the whole and then remove the part to show the final part.



Children to remove three counters then recount the counters remaining on the tens frame to show the answer.

Children to start from the biggest number and make jumps back depending on how many they are taking away. Children to use a counter to help them when counting each number back.



Subtraction

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

Year 1

National curriculum

- 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 $7 = \quad - 9$.

Resources

- objects for counting
- Part whole models
- Tens frames
- Number tracks/ number lines
- Multilink

Concrete

Subtract by crossing out

Children to replicate crossing out with concrete resources by removing them from the whole.



Pictorial

children to draw pictures to represent the number sentence and then show they are taking away by crossing out.

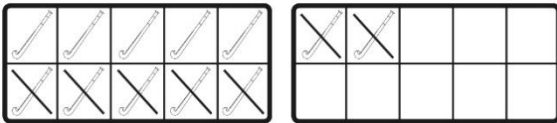


Abstract

Subtract using number bonds

Whole- part = part

Partition whole into two separate parts



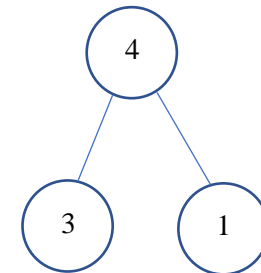
Represent the concrete resources through drawing part whole models

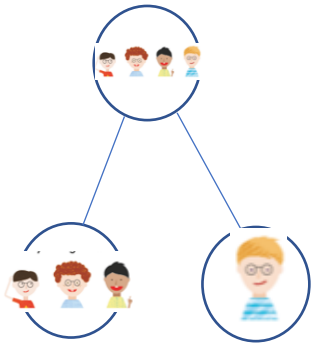
$$3 + 1 = 4$$

$$1 + 3 = 4$$

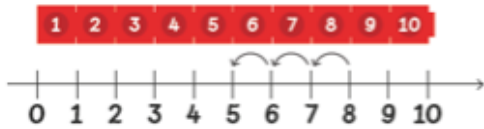
$$4 - 3 = 1$$

$$4 - 1 = 3$$



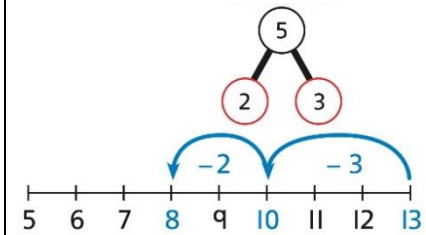
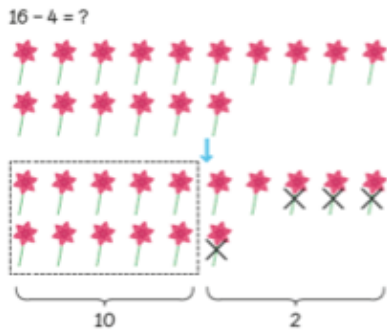


Subtract by counting back



Subtracting ones

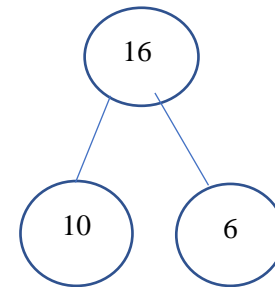
Group the objects into one ten and ones. Then take away from the tens.
Represent using a tens frame



Children to count back mentally without the need for a number line.

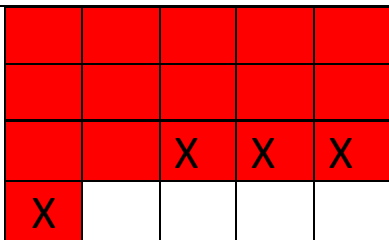
Represent previous representation using pictures.

Partition the whole and then take away the ones separately.



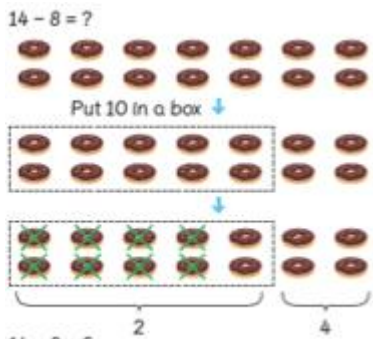
$$6 - 4 = 2$$

$$2 + 10 = 12$$

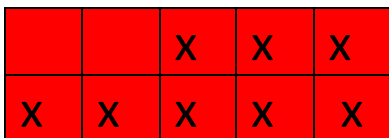


Subtracting from 10 when there are less ones

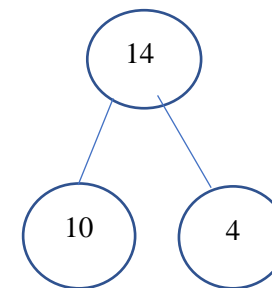
Partition 14 into 10 and 4. Children should realise that they cannot take away the ones as there are too many. They should then take away from the tens.



Use tens frames to partition the number into tens and ones. Then take away from the tens.



Represent previous representation using pictures.



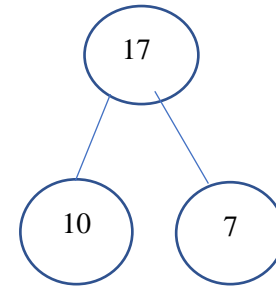
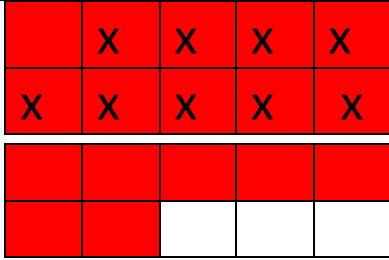
$$10 - 8 = 2$$

$$2 + 4 = 6$$



Conceptual variation: $17 - 9 =$

use tens frames pictorially



$$10 - 9 = 1$$

$$1 + 7 = 8$$

Subtraction

Key Language: part, whole, tens, ones, renaming, smaller, renaming, subtracting, taking away, minus, difference

Year 2

National Curriculum

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 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.

Resources

- Dienes
- Place value grids
- Part whole models
- Number lines/tracks
- Counters
- Calculation frames (support with column subtraction)

Concrete

Subtracting ones from a 2 digit number

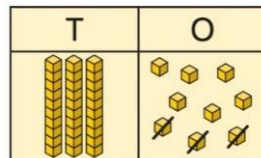
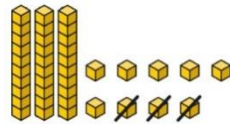
set the layout of the objects that they are counting as a tens frame.



Use place value grids to partition the number into tens and ones. Children cross out the ones they are subtracting.

Pictorial

use dienes to represent the whole and then show that they have taken away by crossing out the ones.



Abstract

Children can partition the whole into tens and ones. Then children will take away the ones from one another and add the tens back on.



T	O

Children could draw number tracks/lines to show that they started at the whole and counted back in steps of one. Children should notice that when you are not renaming, the only part of a number to change when taking away ones is the ones column.

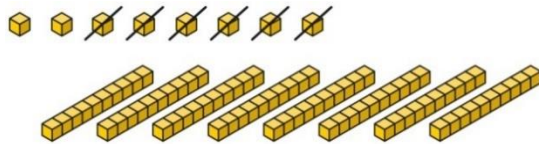


Children should be introduced to column subtraction however this should not be a method that they rely on when subtracting a one digit number from a two digit number without renaming.

	tens	ones
	4	2
+		5
	4	7

Subtracting tens from a 2 digit number

Make links from subtracting ones to subtracting tens.



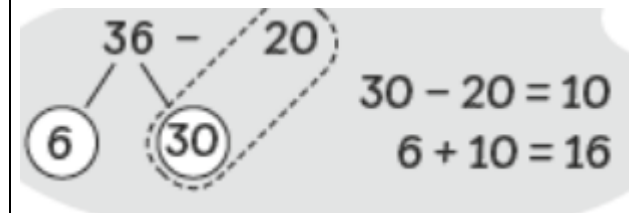
8 subtract 6 is 2.
So, 8 tens subtract 6 tens is 2 tens.

<u>I</u>	<u>O</u>

Number tracks- counting back in steps of ten. Understanding that the tens column reduces by 1 ten when you count back in steps of ten.

13	23	33
----	----	----

Partition the whole into tens and ones. Take away the multiple of ten from the tens in the whole. Then add the ones back onto the tens.

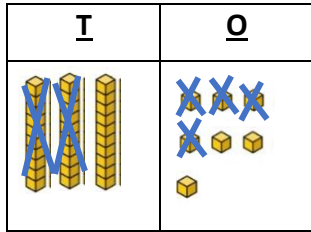


Use column subtraction as you did previously (to introduce it as a method to use), but do not allow children to become reliant on this method as these calculations should be done mentally.

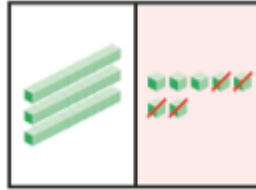
$$\begin{array}{r}
 36 \\
 20 \\
 \hline
 16
 \end{array}$$

Subtract a 2 digit number from a 2 digit number (column subtraction)

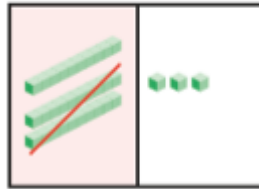
Children to use place value grids and dienes blocks to represent the calculation. Children to remove the dienes that they need to take away from the whole.



Use place value grids to set out the whole. Children should then remove the ones and then the tens. Children to remember that it is 30 - 20 not 3 - 2.



Subtract the tens.
3 tens - 2 tens = 1 ten



Use column addition- children should recognise that this is trickier to do mentally but can still be done if partitioned.

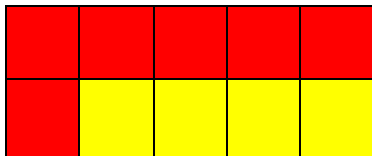
Children should start from the ones and then move to the tens once they have subtracted the ones from each other.

	tens	ones
	3	7
-	2	4
	1	3

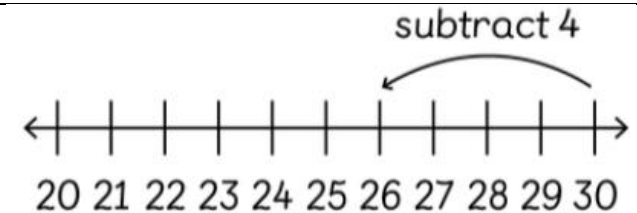
	3	7
-	2	4
	1	3

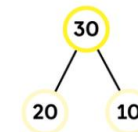
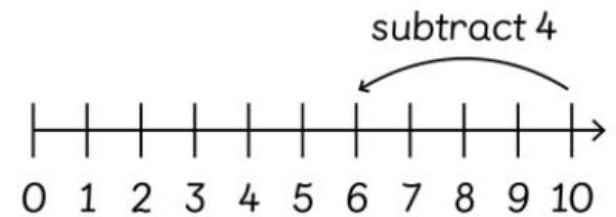
Subtracting from Multiples of 10

Using tens frames to support creating connections to subtraction from multiples of ten and number bonds to ten.



See concrete





$$10 - 4 = 6$$

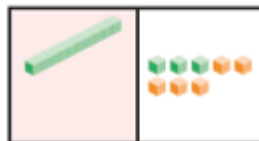
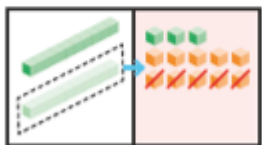
$$20 + 6 = 26$$

$$30 - 4 = 26$$

Subtracting with renaming

Use dienes and place value grids to represent the whole. Children to understand that they cannot take a bigger number away from a smaller

Regroup 1 ten into 10 ones. Subtract the tens.
Subtract the ones.
13 ones - 5 ones = 8 ones



$$23 - 5 = 18$$

number.

Represent the concrete representation pictorially

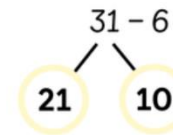
Use column subtraction with renaming. Ensure that children understand that they are moving 1 ten which becomes 10 ones that they add on to the ones there.

tens	ones
1 2	13 3
-	5
	8

tens	ones
1 2	13 3
-	5
1	8

Children may be able to articulate their renaming mentally using partition methods where 10 is already renamed from the previous column:

Take 6 away from 10.

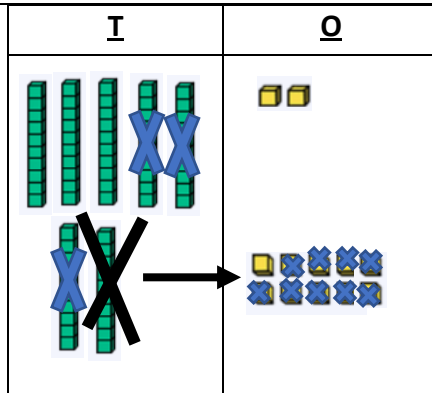


$10 - 6 = 4$
 $4 + 21 = 25$



$31 - 6 = 25$

Conceptual Variation: Find the difference between 72 and 39



Represent dienes work pictorially.

$$\begin{array}{r} \overset{6}{\cancel{7}} \overset{1}{2} \\ 39 \\ \hline 33 \\ \hline \end{array}$$

Use column subtraction

Subtraction

Key Language: part, whole, thousand, hundreds, tens, ones, renaming, smaller, renaming, subtracting, taking away, minus, difference

Year 3

National Curriculum

Resources

Pupils should be taught to:

- 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.

- Dienes
- Place value grids
- Part whole models
- Bar models

Concrete

Subtracting ones from a 3 digit number



214 - 3 =
4 - 3 = 1

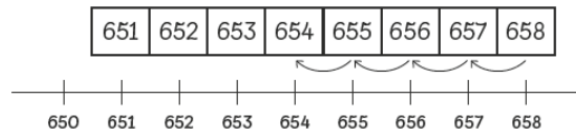
H	T	O	H	T	O
3	1	4	3	1	1

Using dienes to represent a number then removing the ones.

Pictorial

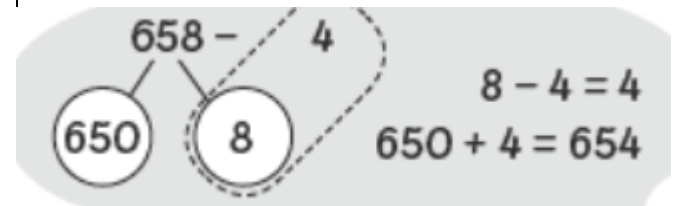
Represent using dienes blocks in previous column pictorially.

Using number tracks to count backwards. Recognising that the only part of the number that is changing is the ones column.



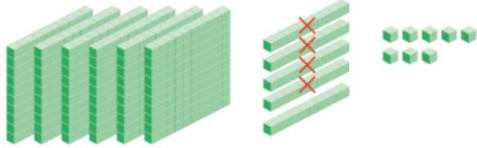
Abstract

Partition the number into hundreds and tens- separating the ones. Take away the ones and then add the tens and ones back on.



Subtracting multiples of ten from a 3 digit number

Create the whole. Take away tens from the tens column. This can be put into a place value grid.

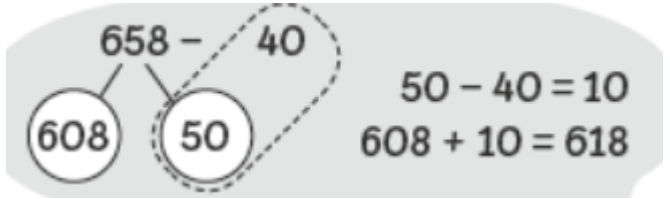


Represent dienes in place value grid from previous column.

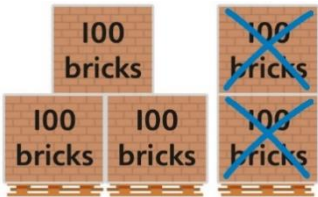
Use number tracks. Children should start at the whole and count back in steps of ten. Children should recognise that the only column to change at this point is the tens column.

618	628	638	648	658
-----	-----	-----	-----	-----

Children should partition the number into hundreds and ones and tens. Children should take away from the tens that have been partitioned



Subtracting hundreds from a 3 digit number



Physically show that part of the hundreds have been subtracted by removing them from the objects.

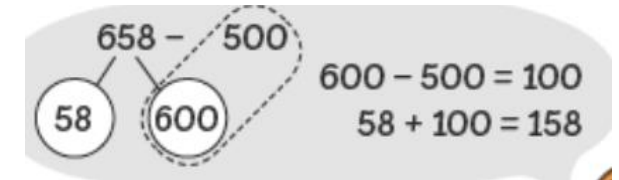
<u>H</u>	<u>T</u>	<u>O</u>
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Draw previous representations pictorially using place a value grid. Children should cross out the hundreds that they are taking away.

Use number tracks. Children to count back in steps of 100 and recognise that the hundreds column is decreasing by one hundred each jump.

128	228	328
-----	-----	-----

Partition the 3 digit number in to hundreds and tens and ones. Children should isolate the hundreds and take away the hundreds needed. Children should then add on the tens and ones.



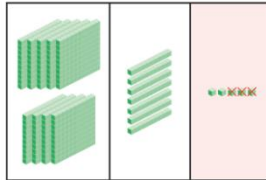


Subtracting 3-digit number from a 3-digit number without renaming (column addition)

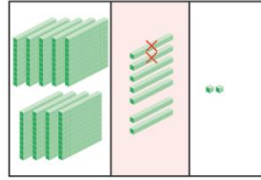
Represent the whole using dienes and take away ones, tens then hundreds from the whole.
Children to show that they have taken away by physically removing the dienes needed.

Use a dienes within a place value grid to represent the two numbers within the subtraction calculation. Children should use their knowledge from column addition to remember that they should start with the ones column.

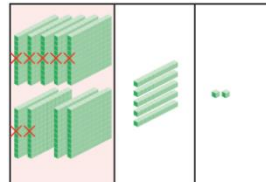
Subtract the ones.
5 ones - 3 ones = 2 ones



Subtract the tens.
7 tens - 2 tens = 5 tens



Subtract the hundreds.
9 hundreds - 7 hundreds = 2 hundreds



Use column addition to represent the previous model.

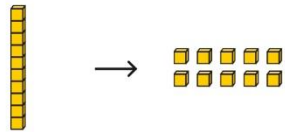
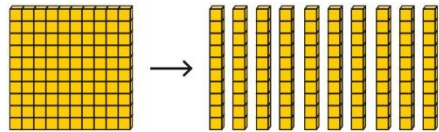
h	t	o
9	7	5
-	7	2
		2

h	t	o
9	7	5
-	7	2
	5	2

h	t	o
9	7	5
-	7	2
2	5	2

Subtracting with renaming tens

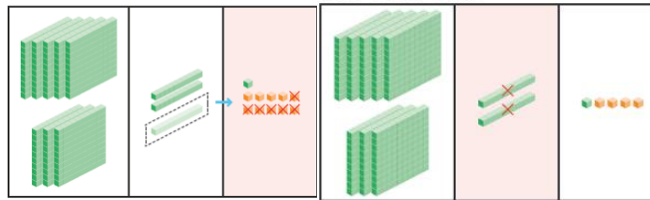
Explore with dienes what 10 ones are equal to. Children to think about how they could use this knowledge to help them when renaming.



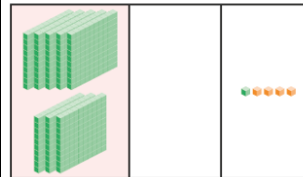
Children to use their understanding of place value to rename numbers when unable to subtract. 1 one – 5 ones cannot be done so children should rename one ten as ten ones and move to the ones column. Children should understand that the ten hasn't been taken away therefore the number is still 821.

Regroup 1 ten into 10 ones.
Subtract the ones.
11 ones – 6 ones = 5 ones

Subtract the tens.
2 tens – 2 tens = 0 tens

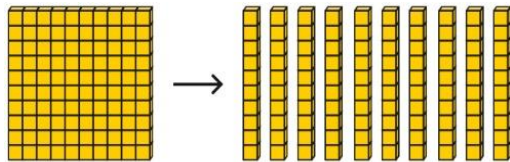


Subtract the hundreds.

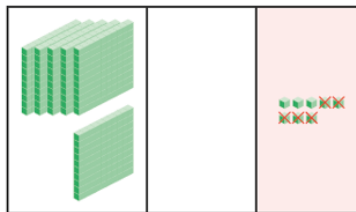


Subtracting with renaming hundreds

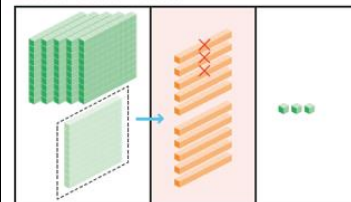
Explore using dienes what 10 tens are equal to. Children should use this information to support



them when renaming.



10 tens – 3 tens = 7 tens



Use column addition and show where renaming is taking place. Children should cross out the tens and show that they are moving it to the ones column as 10 ones .

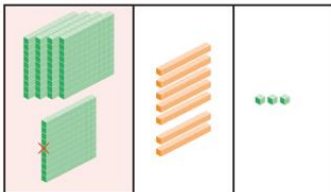
	h	t	o		h	t	o
	8	2	11		8	2	11
-		2	6	-		2	6
<hr/>				<hr/>			
			5			0	5
<hr/>				<hr/>			

	h	t	o
	8	2	11
-		2	6
<hr/>			
	8	0	5
<hr/>			

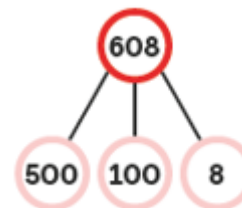
Column subtraction showing renaming.

	h	t	o		h	t	o
	6	0	8		5	10	8
-	1	3	5	-	1	3	5
<hr/>				<hr/>			
			3			7	3
<hr/>				<hr/>			

	h	t	o
	5	10	8
-	1	3	5
<hr/>			
	4	7	3
<hr/>			



Partition the whole to ensure that the 100's have been renamed as the tens.



$$8 - 5 = 3$$

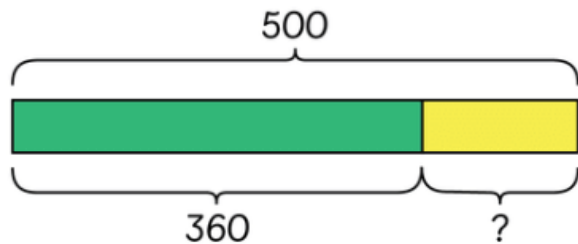
$$100 - 30 = 70$$

$$500 - 100 = 400$$

$$400 + 70 + 8 = 478$$

Subtraction using models

Children to recognise the part-whole relationship within bar models



See concrete representation to represent pictorially

using a method that children find most efficient - column, partitioning.

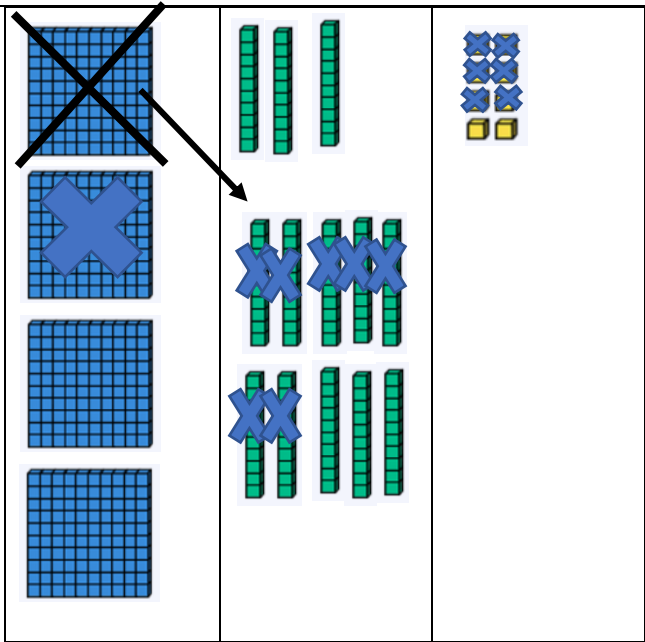
h	t	o
⁴ 5	¹⁰ 0	0
-	3	6
0	0	0
1	4	0

Conceptual Variation: 438 - 176

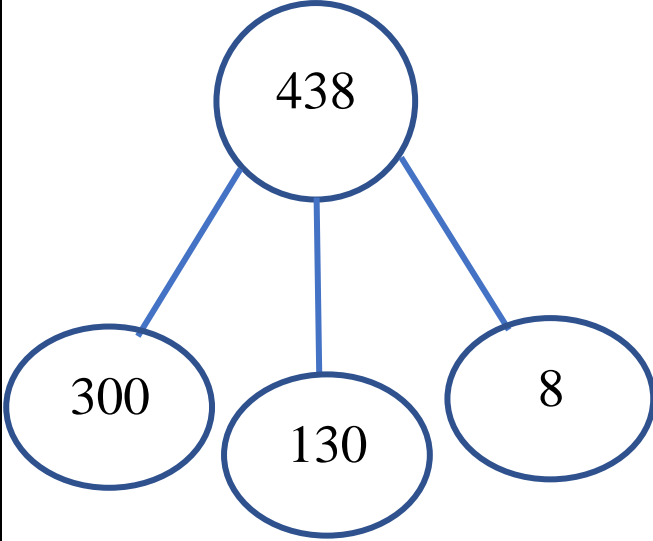
Represent using dienes blocks in a place value grid

<u>H</u>	<u>T</u>	<u>O</u>
----------	----------	----------

$$\begin{array}{r}
 \overset{3}{\cancel{4}}\overset{1}{3}8 \\
 - 176 \\
 \hline
 \end{array}$$



262



$8 - 6 = 2$
 $130 - 70 = 60$

		$300 - 100 = 200$
		$200 + 60 + 2 = 262$

Subtraction

Key Language: part, whole, thousand, hundreds, tens, ones, renaming, smaller, renaming, subtracting, taking away, minus, difference

Year 4

National Curriculum

- 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.

Resources

- dienes
- Place value grids
- Part whole models
- Bar models

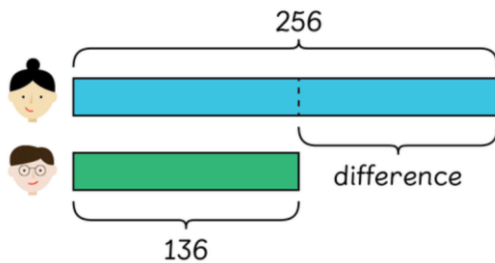
Concrete

Pictorial

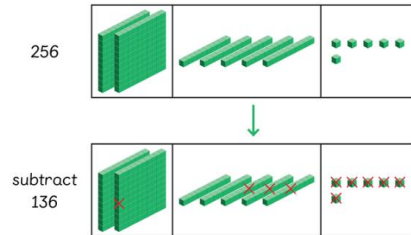
Abstract

Finding Differences

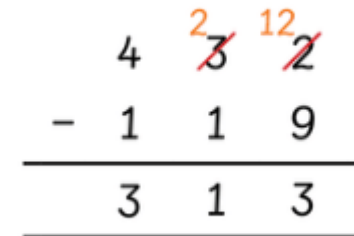
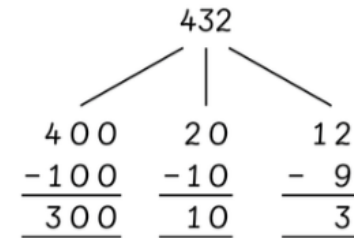
Children to recognise the language 'difference' thinking about the link to subtraction:



Use base 10 materials to subtract.



See concrete

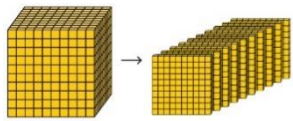


Subtracting with renaming

Represent the use of the place value grid and counters in previous column pictorially.

Use column subtraction to show that they are taking from one column and renaming the amount

Spend time understanding the renaming process and what happens when you rename from one column to another



Use bar models to allow children to see that they are subtracting as they are finding part of the whole.



taken in another column in order to subtract each column one at a time.

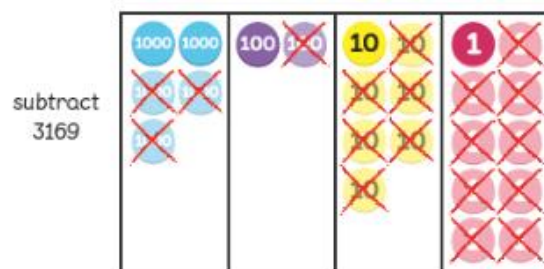
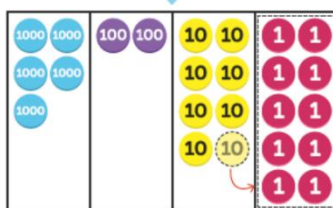
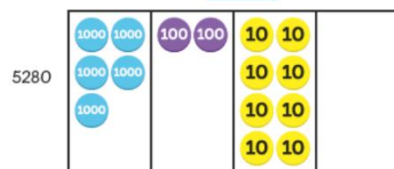
Children need to show their understanding for place value here understanding that one hundred is the same as 10 tens etc.

$$\begin{array}{r} 5 \quad 2 \quad \overset{7}{\cancel{8}} \quad \overset{10}{\cancel{0}} \\ - 3 \quad 1 \quad 6 \quad 9 \\ \hline \hline \end{array} \qquad \begin{array}{r} 5 \quad 2 \quad \overset{7}{\cancel{8}} \quad \overset{10}{\cancel{0}} \\ - 3 \quad 1 \quad 6 \quad 9 \\ \hline 2 \quad 1 \quad 1 \quad 1 \end{array}$$

Children could also partition the number ensuring that they are able to subtract from each column.

$$\begin{array}{cccc} & & 5280 & & \\ & \swarrow & & \searrow & \\ 5 \text{ thousands} & & 2 \text{ hundreds} & & 7 \text{ tens} & & 10 \text{ ones} \\ - 3 \text{ thousands} & & - 1 \text{ hundred} & & - 6 \text{ tens} & & - 9 \text{ ones} \\ \hline 2 \text{ thousands} & & 1 \text{ hundred} & & 1 \text{ ten} & & 1 \text{ one} \end{array}$$

Use place value counters and dienes blocks to allow children to see that they cannot take away from certain columns and will therefore have to rename. Children can then start to move tens to make ones etc. children then subtract from each column.

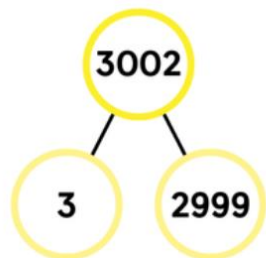


Subtracting using mental strategies

See concrete

children to be able to partition mentally to support them in subtracting.

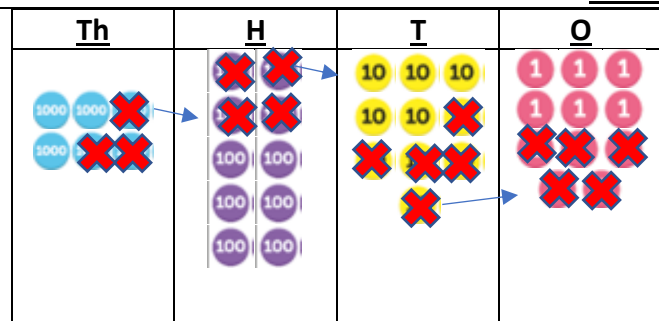
Children to recognise that they can partition wholes to allow them to subtract mentally. Children can use dienes to support this.



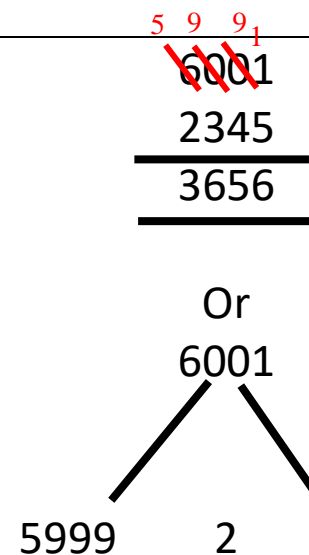
$$2999 - 198 = 2801$$

$$3002 - 198 = 2804$$

Conceptual variation: find the difference between 6001 and 2345



Represent pictorially using place value grids and place value counters.



$$5999 - 2345 = 3654$$

$$3654 + 2 = 3656$$

Subtraction

Key Language:

part, whole, millions, hundreds of thousands, tens of thousands, thousand, hundreds, tens, ones, renaming, smaller, renaming, subtracting, taking away, minus, difference

Year 5

National Curriculum

-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

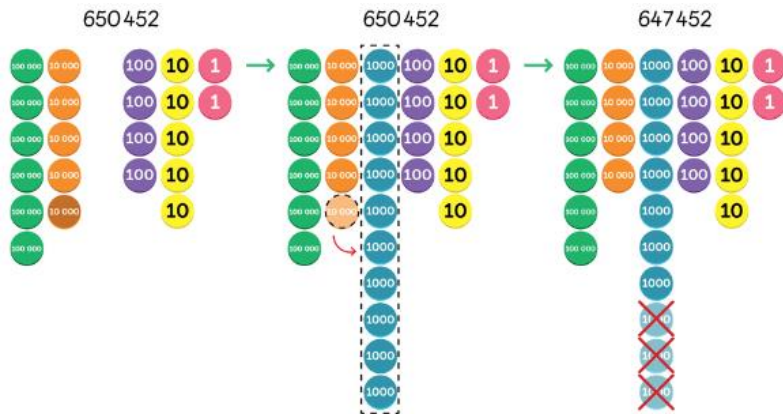
Resources

- Place value counters
- Place value grids
- Decimal counters
- Number tracks

Concrete

Counting Backwards to Subtract

Use place value counters to support children visually with counting backwards. Rename where appropriate using counters.

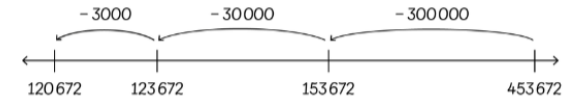


Pictorial

See concrete and represent pictorially

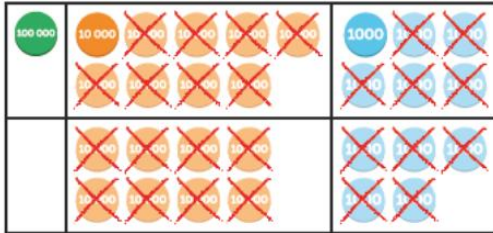
Abstract

Partition the part within the sentence and subtrat each place value column from the number in steps.



Subtracting within a million

Show that they have taken away by removing the counters/crossing out.



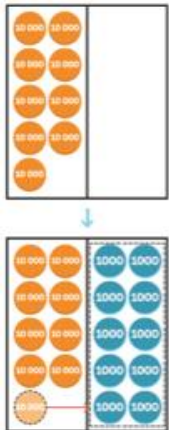
Represent previous representation pictorially

Column subtraction- ensure columns are arranged correctly.

$$\begin{array}{r} 196\ 000 \\ - 85\ 000 \\ \hline 111\ 000 \end{array}$$

Subtracting with renaming

Use place value counters and place value grids to show renaming and then remove the counters you need to subtract.


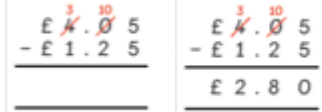


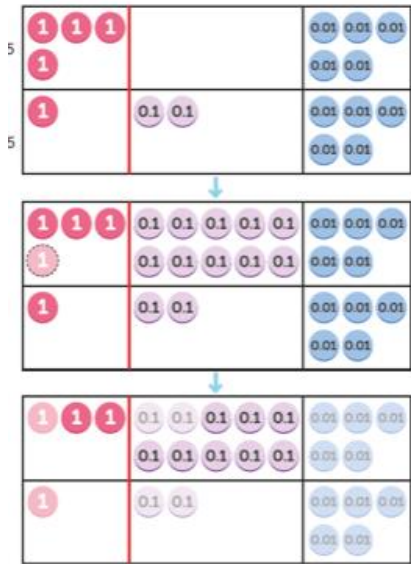
Represent previous representation pictorially.

Column subtraction- ensure understanding of place value for each column.

$$\begin{array}{r} \overset{8\ 10}{\cancel{9}}\ 000 \\ - 54\ 000 \\ \hline \overset{8\ 10}{\cancel{6}}\ 000 \\ - 54\ 000 \\ \hline 36\ 000 \end{array}$$

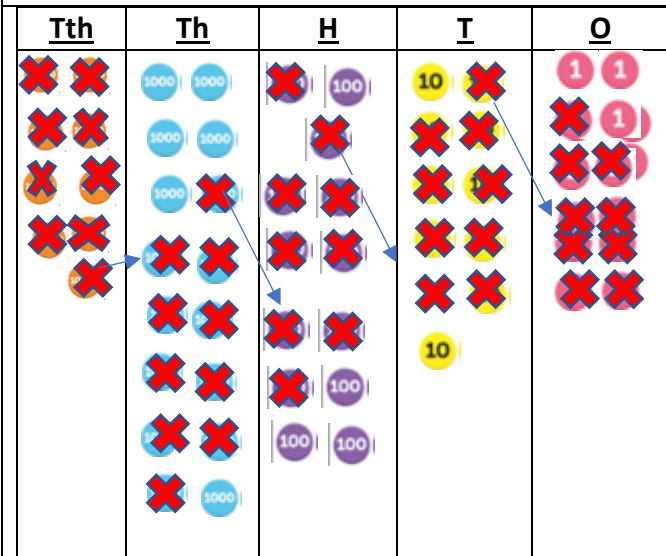
Or

		$\begin{array}{r} 90\ 000 \\ \swarrow \quad \searrow \\ 80\ 000 \quad 10\ 000 \end{array}$ <p> $80\ 000 - 50\ 000 = 30\ 000$ $10\ 000 - 4\ 000 = 6\ 000$ $30\ 000 + 6\ 000 = 36\ 000$ </p>
<p><u>Subtracting decimals without renaming</u></p> <p>Use place value counters to create decimals and then take away by removing the counters.</p>	<p>Use number tracks to support counting backwards/crossing out when subtracting.</p> 	$\begin{array}{r} 2.5 \\ 1.3 \\ \hline 1.2 \\ \hline \end{array}$
<p><u>Subtracting decimals with renaming</u></p> <p>Use place value grids decimal counters to create the whole. Children then take away from this understanding the place value of $0.1 = 10 \times 0.01$ and using this when they are renaming.</p>	<p>Represent the place value grid and draw counters to show previous representation</p>	<p>Column subtraction- ensuring that the columns are lined up correctly including the decimal point.</p> 



Conceptual variation: 95 326 – 89 999

Represent previous representation pictorially.



Or

$$\begin{array}{r}
 \overset{8}{9} \overset{14}{5} \overset{12}{3} \overset{11}{2} \overset{1}{6} \\
 \underline{\quad \quad \quad \quad \quad} \\
 89999 \\
 \underline{\quad \quad \quad \quad \quad} \\
 5327
 \end{array}$$

$$89\,999 + 1 = 90000$$

		$95326 - 90000 = 5326 + 1 = 5327$
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Subtraction

Key Language: part, whole, millions, hundreds of thousands, tens of thousands, thousand, hundreds, tens, ones, renaming, smaller, renaming, subtracting, taking away, minus, difference

Year 6

National Curriculum

- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

Resources

- place value counters
- Place value grids
- Decimal counters

Concrete

Master previous methods

Pictorial

Abstract