

## Our calculation policy - subtraction

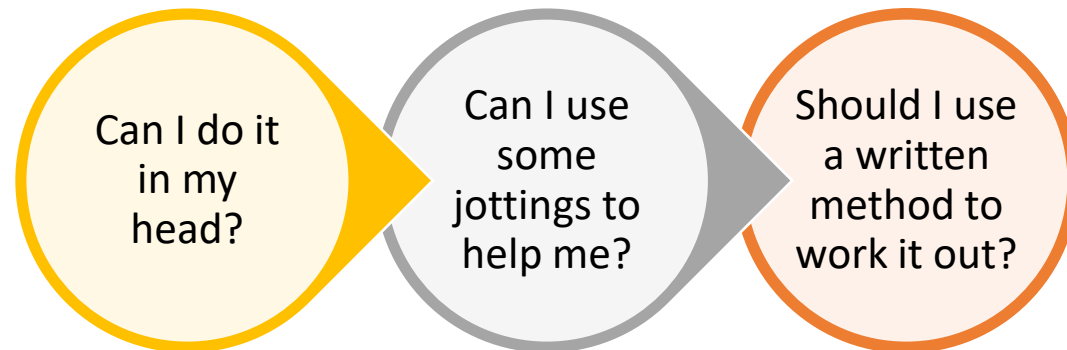
Our calculation policy has been devised to meet and exceed the requirements of the National Curriculum for the teaching and learning of mathematics. It is designed to support pupils in delivering a consistent progression of calculation methods throughout their time at school. Early learning in number and calculation in Reception follows the 'Development Matters' EYFS document, and this calculation policy is designed to build on from the content and methods established in the Early Years Foundation Stage.

### Providing a context for calculation

A problem solving approach helps to build children's understanding of the purpose of calculation, and to help them recognise when to use certain operations and methods when faced with problems. It is important that any type of calculation is given a real life context. This must be a priority within calculation lessons.

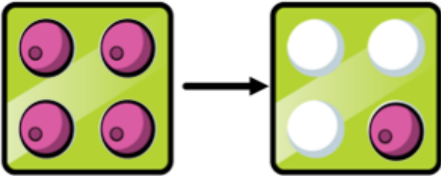
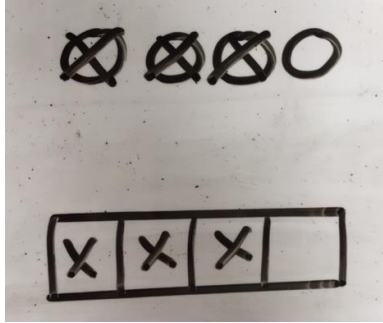
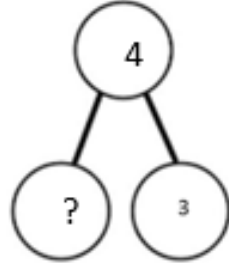
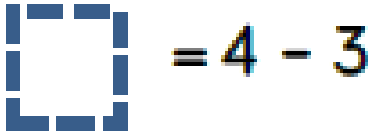
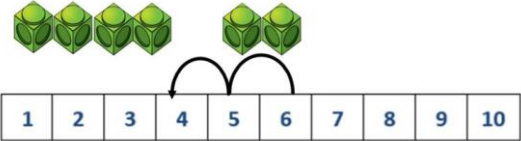
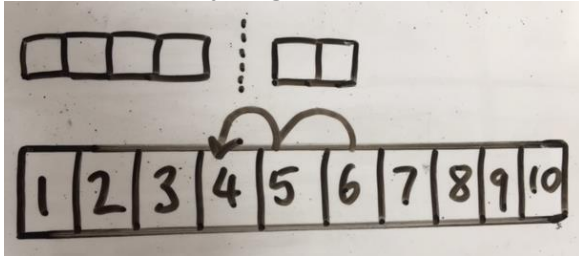
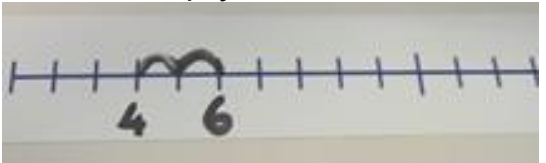
### Choosing a calculation method

Children are encouraged to use the following processes in deciding what approach they will take to a calculation...



# Subtraction

## Early Years Subtract with numbers up to 20

Concrete	Pictorial	Abstract
<p><b>Physically taking away and removing objects from a whole</b> (ten frames, Numicon, cubes and other items such as beanbags could be used).</p> 	<p>Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used.</p> 	<p><math>4 - 3 =</math></p>  
<p>Counting back (using number lines or number tracks) children start with 6 and count back 2.</p> 	<p>Children to represent what they see pictorially e.g.</p> 	<p>Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line</p> 

# Subtraction

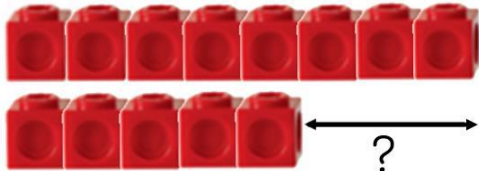
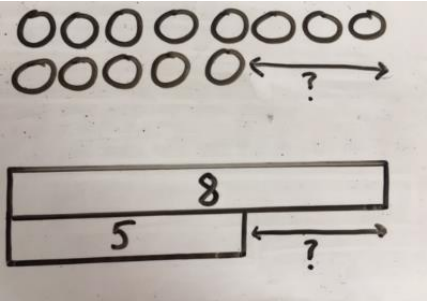

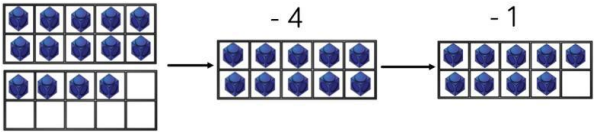
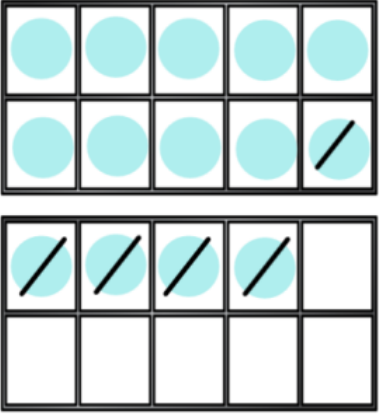
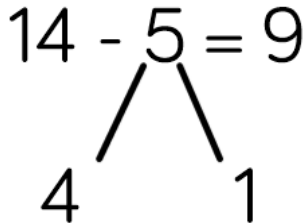
**Key skills:**

- Recognise numerals 1 to 20 and place them in order.
- Count actions or objects which cannot be moved.
- Help children to recognise that when a group of objects is separated in different ways the total is the same
- Model and encourage the use of mathematical language, e.g. 'less' and 'fewer'
- Estimate how many objects they can see and check by counting.
- Say the number that is one less than a given number using fingers, number lines and objects.
- Record, using marks and pictures that they can interpret and explain.
- Help children to recognise that when a group of objects is separated in different ways the total is the same.
- Pose problems such as 'how many will there be when we take 5 away?

Vocabulary: take, take away, less, minus, subtract, leaves, difference

# Subtraction

**Year 1 Subtract with numbers up to 20 Subtract by taking away (reduction), Finding the difference between (comparison) and mental subtraction**

Concrete	Pictorial	Abstract
<p>Finding the difference (using cubes, Numicon or Cuisenaire rods, other objects can also be used). Calculate the difference between 8 and 5</p> 	<p>Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate.</p> 	<p>Find the difference between 8 and 5.  <math>8 - 5</math>, the difference is </p> <p>Children to explore why <math>9 - 6 = 8 - 5 = 7 - 4</math> have the same difference.</p>
<p>Making 10 using ten frames.</p> <p><math>14 - 5</math></p> 	<p>Children to present the ten frame pictorially and discuss what they did to make 10.</p> 	<p>Children to show how they can make 10 by partitioning the subtrahend.</p> $14 - 5 = 9$  <p><math>14 - 4 = 10</math>  <math>10 - 1 = 9</math></p>

# Subtraction

## Key skills:

- 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 (i.e. bead string, objects, cubes) and pictures, and missing number problems.

New Vocabulary: distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is\_?

## Year 1 Advice for staff

Find out how many have been removed by **counting up** to the larger number. For example, respond to:

There were 8 books on this shelf. There are only 5 books now.

How many have gone?

(Count up from 5 to 8: 6, 7, 8... and say 3. Say together: 5 add 3 is 8. 8 take away 3 is 5.)

Count 6 cotton reels into an open box.

Take a few out (say 2) and put them on the table.

Say (without peeping) how many are still in the box. (Count up from 2: 3, 4, 5, 6... and say 4.

Say together: 2 add 4 is 6. 6 take away 4 is 2.)

Count out 4 pennies. Secretly put some in one hand and some in the other. Show the pennies in one hand (say, 1 penny).

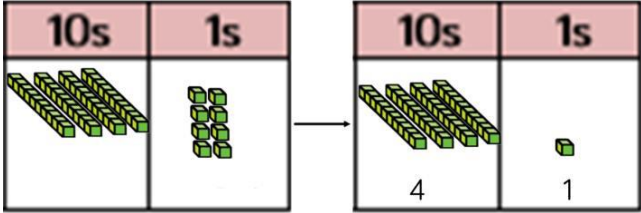
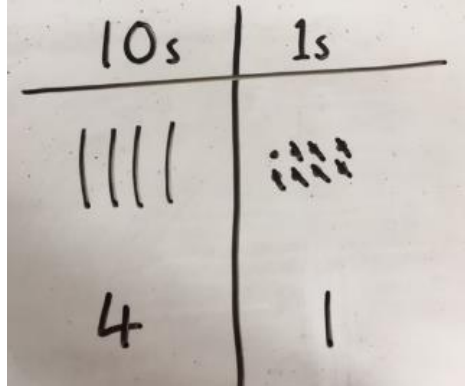
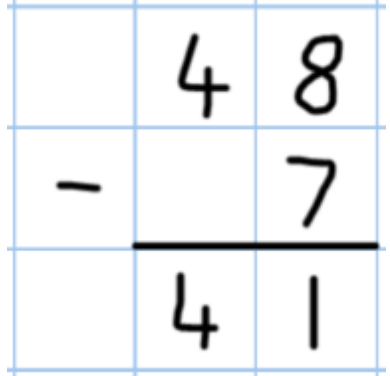
How much is there in the other hand?

(Count up from 1 to 4: 2, 3, 4... and say 3.

Say together: 1 add 3 is 4. 4 take away 3 is 1.)

# Subtraction

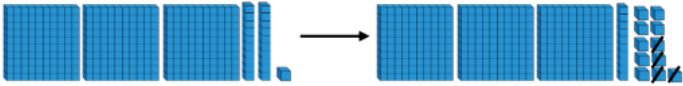
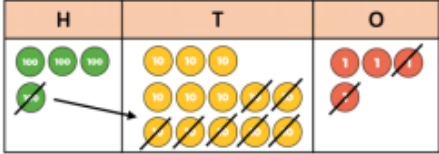

## Year 2 Subtract with 2-digit numbers

Concrete	Pictorial	Abstract
<p>Column method using base 10. 48-7</p> 	<p>Children to represent the base 10 pictorially.</p> 	<p>Column method or children could count back 7.</p> 
<p><b>Key skills:</b></p> <ul style="list-style-type: none"> <li>• Recognise the place value of each digit in a two-digit number.</li> <li>• Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100.</li> <li>• Subtract using concrete objects, pictures and mentally, including: a two-digit number and ones, a two-digit number and tens, and two two-digit numbers.</li> <li>• Show that subtraction of one number from another cannot be done in any order.</li> <li>• Recognise and use inverse relationship between addition and subtraction, using this to check calculations and missing number problems.</li> <li>• Solve simple subtraction problems including measures, using concrete objects, pictorial representation, and also applying their increasing knowledge of mental and written methods.</li> <li>• Read and write numbers to at least 100 in numerals and in words.</li> </ul> <p>New Vocabulary: <b>count on, strategy, partition, tens, units</b></p>		



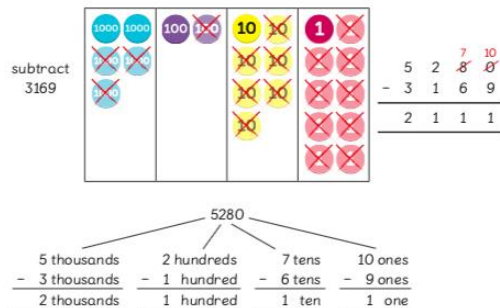
# Subtraction

## Year 3 Subtracting with 2 and 3-digit numbers.

Concrete	Pictorial	Abstract
<p>Column method using base 10/ place value counters and having to exchange. 321 - 4</p> <p>Teddy uses Base 10 to calculate <math>321 - 4</math></p> 	<p>Represent the base 10 pictorially, remembering to show the exchange.</p> 	<p>Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because <math>41 = 30 + 11</math>.</p> 
<p><b>Key skills:</b></p> <ul style="list-style-type: none"> <li>Subtract mentally: 3-digit number and ones, 3-digit number and tens, 3-digit number and hundreds</li> <li>Estimate answers and know that addition is the inverse of subtraction.</li> <li>Solve problems, including missing number problems.</li> <li>Find 10 or 100 more or less than a given number.</li> <li>Solve simple measure and money problems.</li> <li>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.</li> </ul> <p>New Vocabulary: <b>exchange, decrease, hundreds, digit, inverse</b></p>		

# Subtraction

## Year 4 Subtracting with 3 and 4-digit numbers.

Concrete	Pictorial	Abstract																																
<p>Column method using base 10/ place value counters and having to exchange.</p> <p>5280 - 3169</p>  <p>5280</p> <table><tr><td>5 thousands</td><td>2 hundreds</td><td>7 tens</td><td>10 ones</td></tr><tr><td>- 3 thousands</td><td>- 1 hundred</td><td>- 6 tens</td><td>- 9 ones</td></tr><tr><td>2 thousands</td><td>1 hundred</td><td>1 ten</td><td>1 one</td></tr></table>	5 thousands	2 hundreds	7 tens	10 ones	- 3 thousands	- 1 hundred	- 6 tens	- 9 ones	2 thousands	1 hundred	1 ten	1 one	<p>Represent the base 10 pictorially, remembering to show the exchange up to 10,000.</p>	<p>Formal column method.</p> <p>Children must understand that when they have exchanged the 10 they still have 5643 because <math>5643 = 5630 + 13</math></p> <table><tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>5</td><td>6</td><td><del>3</del>4</td><td>13</td></tr><tr><td>-</td><td>4</td><td>3</td><td>1</td><td>6</td></tr><tr><td></td><td>1</td><td>3</td><td>2</td><td>7</td></tr></table>		Th	H	T	O		5	6	<del>3</del> 4	13	-	4	3	1	6		1	3	2	7
5 thousands	2 hundreds	7 tens	10 ones																															
- 3 thousands	- 1 hundred	- 6 tens	- 9 ones																															
2 thousands	1 hundred	1 ten	1 one																															
	Th	H	T	O																														
	5	6	<del>3</del> 4	13																														
-	4	3	1	6																														
	1	3	2	7																														
<p><b>Key skills:</b></p> <ul style="list-style-type: none"><li>Subtract mentally: 4-digit number and ones, 4-digit number and tens, 4-digit number and hundreds, 4-digit numbers and thousands.</li><li>Estimate answers and use inverse operations to check.</li><li>Solve problems, including missing number problems.</li><li>Find 100 or 1000 more or less than a given number.</li><li>Solve simple measure and money problems.</li><li>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.</li></ul> <p>New Vocabulary: <b>exchange, decrease, thousands, inverse, estimate</b></p>																																		



# Subtraction

## Year 3/4 Advice for staff

STEP 1: introduce the method with examples where no exchanging is required.  $89 - 35 = 54$

$$80 + 9$$

$$- \underline{30 + 5}$$

$$50 + 4$$

Approximate, Calculate, Check it mate!

STEP 2: introduce exchanging through practical subtraction. Make the larger number with Base 10, then subtract 47 from it.

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.

$$^{60}\cancel{70} + ^{12}\cancel{2}$$

$$- \underline{40 + 7}$$

$$20 + 5 = 25$$

$$72 - 47$$



When learning to exchange, explore partitioning in different ways so that pupils understand that when you exchange, the VALUE is the same ie:

$$72 = 70 + 2 = 60 + 12 = 50 + 22 \text{ etc.}$$

Emphasize that the value hasn't changed, we have just partitioned it in a different way.

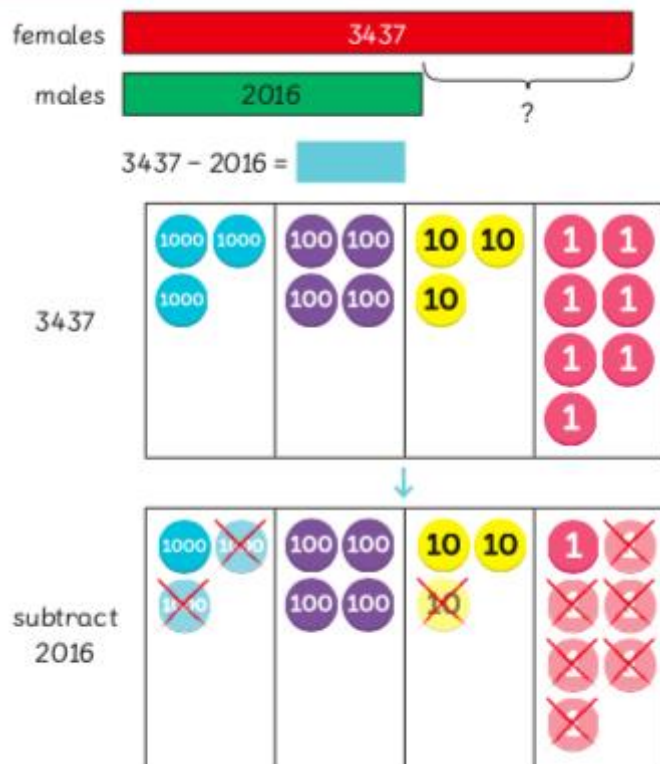
# Subtraction

Year 5 & 6 Subtracting with increasingly large and more complex numbers and decimal values.

## Concrete/ Pictorial

Place value counters & bar model to visually support column subtraction.

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



## Abstract

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

$$\begin{array}{r} \cancel{2}^{\text{th}} \cancel{1}^{\text{th}} 0 \cancel{5}^{\text{th}} 6 \\ - \quad 2128 \\ \hline 28,928 \end{array}$$

$$\begin{array}{r} \cancel{7}^{\text{th}} \cancel{1}^{\text{th}} 6 \cancel{9}^{\text{th}} \cdot 0 \\ - \quad 372 \cdot 5 \\ \hline 6796 \cdot 5 \end{array}$$

$$\begin{array}{r} \cancel{1}^{\text{th}} \cancel{0}^{\text{th}} 5 \cdot \cancel{4}^{\text{th}} 119 \text{ kg} \\ - \quad 36 \cdot 08 \text{ kg} \\ \hline 69 \cdot 339 \text{ kg} \end{array}$$

# Subtraction

## Key skills:

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

New Vocabulary: **exchange, decrease, hundreds, digit, inverse**