Subtraction

About our calculation policy

The following calculation policy has been devised to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics, and is also designed to give pupils a consistent and smooth progression of learning in calculations across the school. Please note that early learning in number and calculation in Reception follows the 'Development Matters' EYFS document, and this calculation policy is designed to build on progressively from the content and methods established in the Early Years Foundation Stage.

Age stage expectations

The calculation policy is organised according to age stage expectations as set out in the National Curriculum 2014, however it is vital that pupils are taught according to the stage that they are currently working at, being moved onto the next level when they are ready or working at a lower stage until they are secure enough to move on.

Providing a context for calculation

It is important that any type of calculation is given a real life context or problem solving approach to help 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. This must be a priority within calculation lessons.

Choosing a calculation method

Children need to be taught and encouraged to use the following processes in deciding what approach they will take to a calculation, to ensure they select the most appropriate method for the numbers involved:

Can I do it in my head?

Could I use some jottings to help me?

Should I use a written method to work it out?

Subtraction

Early Years Subtract with numbers up to 20

combining two sets of objects into one group (5 cubes and 3 cubes)

Key skills for subtraction in Early Years:

- 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?

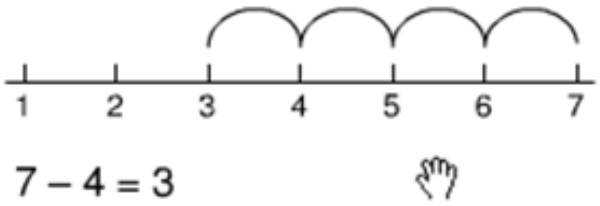
Vocabulary: take, take away, less, minus, subtract, leaves, difference

Subtraction

year 1 Subtract with numbers up to 20

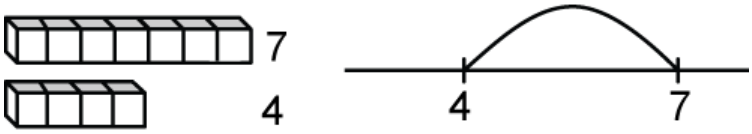
Children consolidate understanding of subtraction practically, showing subtraction on their fingers, bead strings, using cubes etc. and in familiar contexts, and are introduced to more formal recording using number lines as below:

Subtract by taking away (reduction)



Count back in ones on a numbered number line to take away, with numbers up to 20:

Find the distance between (comparison)



The difference between 7 and 4 is 3.

" Seven is 3 more than four"

This will be introduced practically with the language **'find the distance between'** and **'how many more?'** in familiar contexts.

Mental subtraction Children should start recalling subtraction facts up to and within 10 and 20, and should be able to subtract zero.

Key skills for subtraction at Y1:

- 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.
- Read and write numbers from 0 to 20 in numerals and words.

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

Subtraction

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 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.)

- 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.)

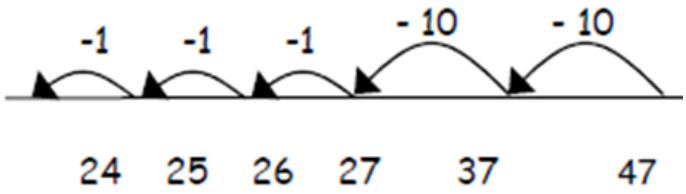
Subtraction

Year 2 Subtract with 2-digit numbers

Subtract on a number line by counting back, aiming to develop mental subtraction skills.

Subtracting pairs of 2-digit numbers on a number line

Partitioning the second number and subtracting it first in tens and units: 47 – 23 = 24, then in more efficient way.



Mental strategy - subtract numbers close together by counting on:
Children are taught to recognise that when numbers are close together, it is more efficient to **count on** the difference. They need to be clear about the relationship between addition and subtraction.

Key skills for subtraction at Y2:

- 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, pictures 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 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.

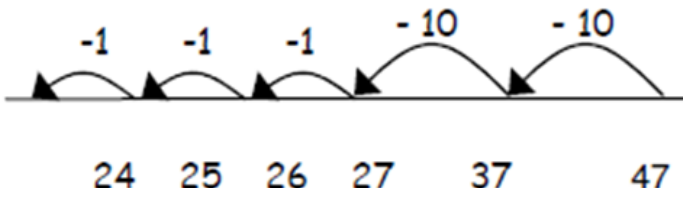
Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, difference, distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_? count on, strategy, partition, tens, units

Subtraction

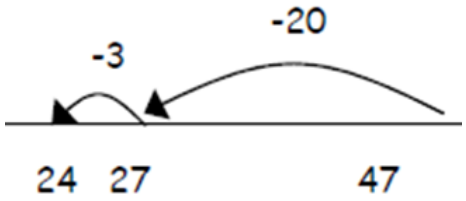
Year 2 Advice for staff

STEP 1: Partition the second number and subtract it in tens and units:

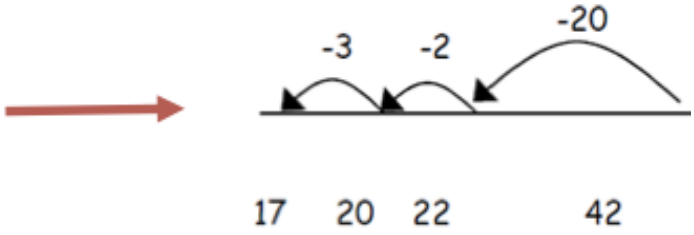
47 - 23 = 24



STEP 2: Move towards more efficient jumps back



STEP 3: Once children are confident teaching them to bridge through ten can help them to become more efficient, for example 42—25:



STEP 4: Introduce more efficient (less errors) **counting up from the smaller number** to the larger number for problems using large numbers:

'Counting Up Subtraction' - Maths Frog

200 - 167

Maths Frog ALWAYS jumps to the nearest 10

Use Dienes blocks for subtraction calculations too.

Subtraction

Year 3 Subtracting with 2 and 3-digit numbers.

The partitioned column subtraction method.

89 – 35 = 54

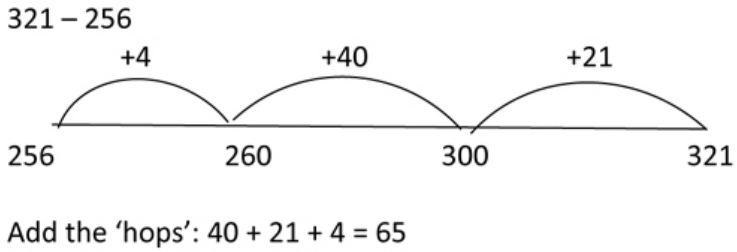
$$\begin{array}{r} 80 + 9 \\ -\ 30 + 5 \\ \hline 50 + 4 \end{array}$$

Introduce "exchanging" through practical subtraction.

$$\begin{array}{r} {}^{60}\cancel{70} + {}^{12}\cancel{2} \\ -\ 40 + \ \ 7 \\ \hline 20 + \ \ 5 = 25 \end{array}$$

Counting on as a mental strategy for subtraction

Continue to reinforce counting on as a strategy for close-together larger numbers (e.g. 321—256) Start at the smaller number and count on in tens first, then count on in units to find the rest of the difference:



Add the 'hops': 40 + 21 + 4 = 65

Key skills for subtraction at Y3:

- 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.
- 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.

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

Subtraction

Year 3 Advice for staff

Continue to praise and share all methods of subtraction introducing the more efficient Partitioned column subtraction method.

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

$$\begin{array}{r} 80 + 9 \\ -\ 30 + 5 \\ \hline 50 + 4 \end{array}$$

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.

$$\begin{array}{r} {}^{60}\cancel{70} + {}^{12}\cancel{2} \\ -\ 40 + \ \ 7 \\ \hline 20 + \ \ 5 = 25 \end{array}$$

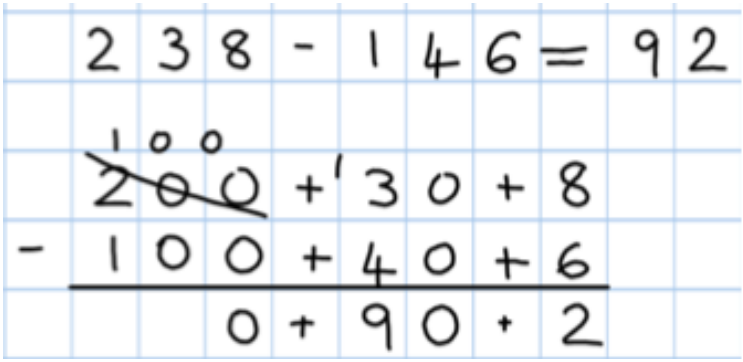
72 - 47

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 etc.

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

STEP 3: Once pupils are secure with 'exchanging' they can use the partitioned method to subtract any 2 or 3 digit number



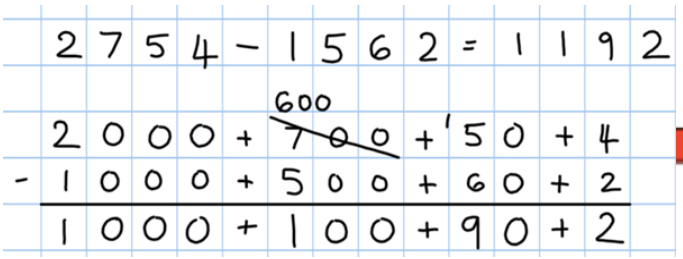
Subtracting money: partition into e.g. £1 + 30p + 8p

Subtraction

Year 4 Subtract with up to 4 digits

As introduced in Y3, but moving towards more complex numbers and values. Use place value counters to reinforce exchanging.

Partitioned column subtraction with "exchanging" (decomposition)



$2^{600}\cancel{7}\,^{15}\cancel{5}4$

$-\ 1\quad 5\quad 62$

$1\quad 1\quad 92$

Mental Strategies

A variety of mental strategies must be taught and practiced, including counting on to find the difference where numbers are closer together, or where it is easier to count on

Key skills for subtraction at Y4:

- Subtract by counting on where numbers are close together or they are near to multiples of 10, 100 etc.
- 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.

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

Subtraction

Year 4 Advice for staff

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

Give plenty of opportunities to apply this to money and measures.

Always encourage children to consider the best method for the numbers involved - mental, counting on, counting back or written method

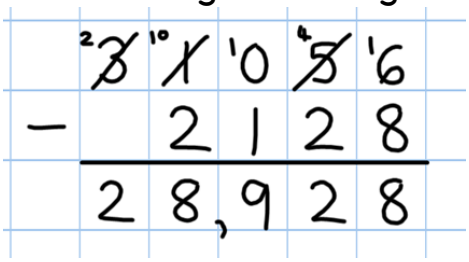
Success stars when marking:

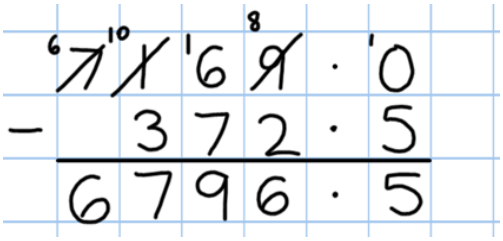
- Subtract units first
- Exchange numbers over the top of the existing number.
- Reinforce correct place value by reminding them the actual value is 5 hundreds add 3 hundreds, not 5 add 3, for example.

Subtraction

Year 5 Subtract with at least 4 digits including money, measures and decimals with different numbers of decimal

Subtracting with larger integers.





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

Key skills for subtraction at Y5:

- 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.

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

Subtraction

Year 5 Advice for staff

Numbers should now exceed 4 digits.

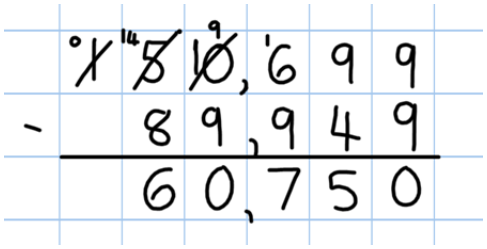
Children should:

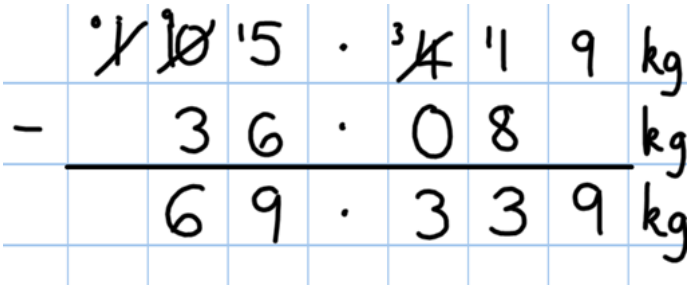
- Add a 'zero' in any empty decimal places to aid understanding of what to subtract in that column.
- Understand the place value of tenths and hundredths and use this to align numbers with different numbers of decimal places.
- Have lots of opportunities for subtracting and finding differences with money and measures.

Subtraction

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

Using the compact column method to subtract more complex integers





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

Pupils 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.

Key skills for subtraction at Y6:

- Solve addition and subtraction multi-step problems in context, deciding which operations and methods
- 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.

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

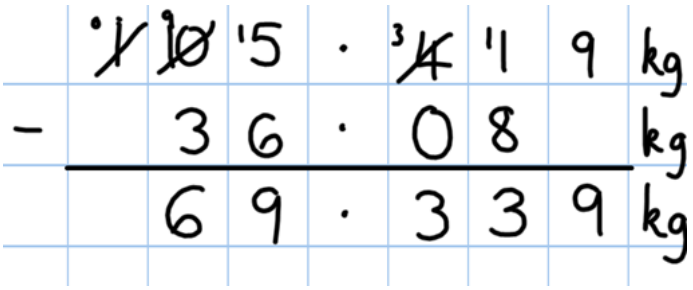
Subtraction

Year 6 Advice for staff

Adding several numbers with more than 4 digits.

Children should be encouraged to subtract several numbers with different numbers of decimal places (including money and measures)

Tenths, hundredths and thousandths should be correctly aligned, with the decimal point lined up vertically including in the answer row.



Zeros should be added into any empty decimal places, to show there is no value to add. Empty decimal places can be filled with zero to show the place value in each column.