

-Subtraction-

Children should not be made to go onto the next stage if:

1) they are not ready.

2) they are not confident.

- ✓ Children should be taught through real life experiences and word problems.
- ✓ Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.
- ✓ Children should be encouraged to approximate their answers before calculating.
- ✓ Children should be encouraged to check their answers after calculation using an appropriate strategy.

Year 1



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

Key skills for subtraction at Y1:

- Recall bonds to 5,6,7,8,9,10 and 20, (number bond 'story')
- 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.
- Use number facts to subtract single-digit numbers from 2-digit numbers, e.g. use 7-2 to work out 27-2, 37-2

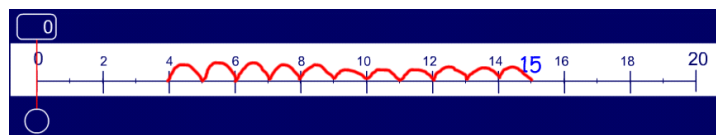
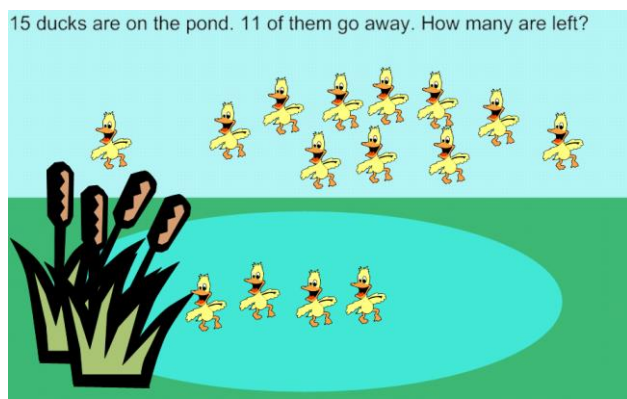
- Understand subtraction as 'take away' and find a 'difference' by counting up; use practical and informal written methods to support the subtraction of a one-digit number from a one digit or two-digit number and a multiple of 10 from a two-digit number

Taking away

Children interpret subtraction as 'taking away'. They represent 'taking away' using objects and with number sentences, recognising that the number of objects remaining is the answer in a calculation such as $15 - 11 = 5$.

They begin to rely less on manipulating practical resources and use strategies such as counting back on a number line or software that provides images and diagrams.

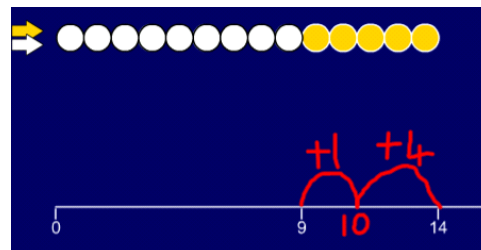
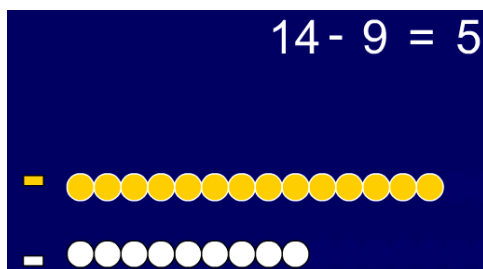
15 ducks are on the pond. 11 of them go away. How many are left?





Finding the difference

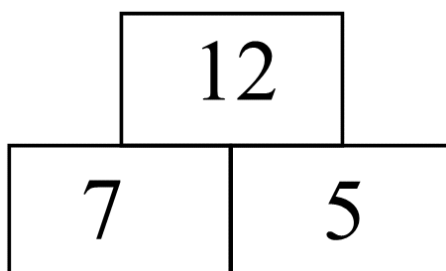
Children build on their understanding of subtraction to interpret $14 - 9$ as finding the difference between 14 and 9 or: 'How many more must I add to 9 to get 14?' They use a counting on strategy and record the process as steps on a number line.



Inverse relationship

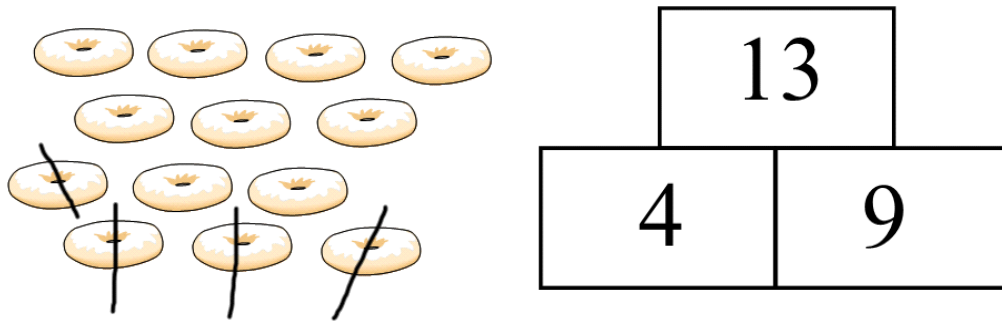
They construct sequences of calculations involving subtraction such as: $5 - 1 = 4$, $6 - 2 = 4$, $7 - 3 = 4$, ... They continue sequences such as: $12 - 0 = 12$, $12 - 1 = 11$, $12 - 2 = 10$, ... to build up patterns of calculations that highlight the underlying process of subtraction. They begin to

recognise that subtraction and addition 'undo each other'.



e.g. $7 + 5 = 12$ and $12 - 7 = 5$

Children apply their knowledge to problems; for example, they work out how many biscuits are left on a plate of 13 biscuits if 4 are eaten. They solve problems such as finding the biggest and smallest possible differences between a pair of numbers from the set 8, 5, 12 and 6.



Using +/ - and = signs

Children record addition and subtraction number sentences using the operation signs + and -. They generate equivalent statements using the equals sign, for example:

$7 = 6 + 1$; $7 = 5 + 2$...etc

$7 = 8 - 1$; $7 = 9 - 2$...etc

They recall the number that is 1 or 10 more or less than a given number and use this to support their calculations, for example to give answers to $12 + 1$, $13 - 1$ and $30 + 10$ and $60 - 10$.

Year 2



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

difference, count on, strategy, partition, tens, units

Key skills for subtraction at Y2:

- Recognise the place value of each digit in a two-digit number.
- Recall and use subtraction facts to 12, 20 fluently, and derive and use related facts up to 100 (number bonds story).
- Subtract using concrete objects, pictorial representations, 100 squares and mentally, including: a two-digit number and ones, a two-digit number and tens, and two two-digit numbers.
- Show that subtraction of one number from another cannot be done in any order.
- Recognise and use inverse relationship between addition and subtraction, using this to check calculations and missing number problems.
- Solve simple addition and subtraction problems including measures, using concrete objects, pictorial representation, and also applying their increasing knowledge of mental and written methods.
- Read and write numbers to at least 100 in numerals and in words.

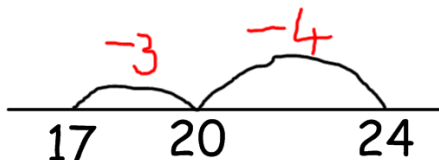
Children subtract with 2-digit numbers.

Counting back – they subtract on a number line by counting back, aiming to develop mental calculation skills.

This strategy will be used for:

- 2-digit numbers subtract ones (by taking away / counting back) e.g. 24-7

$$24 - 7 = 17$$



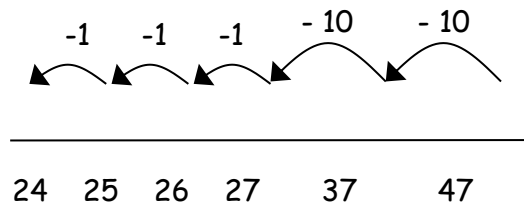
Use Dienes blocks for subtraction calculation too

- 2-digit numbers subtract tens (by taking away / counting back) e.g. 48-3
- Subtracting pairs of 2-digit numbers -counting back in tens and ones.

$$47 - 23 = 24$$

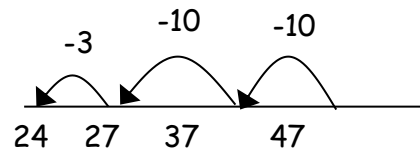
Then subtract the ones

Subtract 10s first



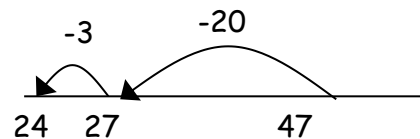
- Then helping children to become more efficient by subtracting the units in one jump (by using the known fact $7 - 3 = 4$).

$$47 - 23 = 24$$

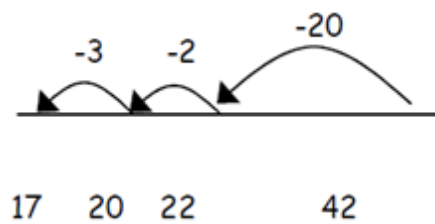


Combine methods with use of a hundred square to reinforce understanding of number value and order.

- Subtracting the tens in one jump and the units in one jump.



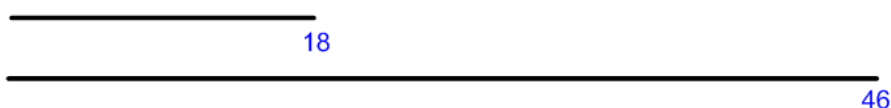
Teaching children to bridge through ten can help them become more efficient, for example $42-25$.



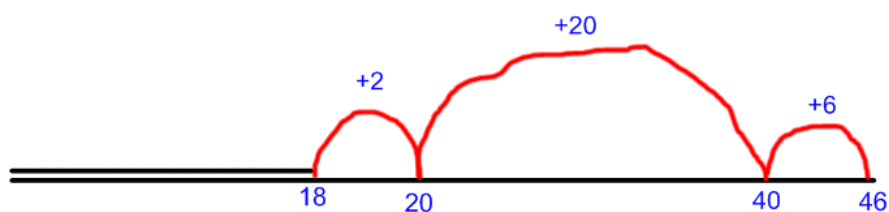
Finding the difference / counting on.

e.g. Work out the difference between 46 and 18.

Children should be encouraged to solve these types of calculation by representing both numbers initially on separate number lines and reinforcing the language of how many more or less, e.g.



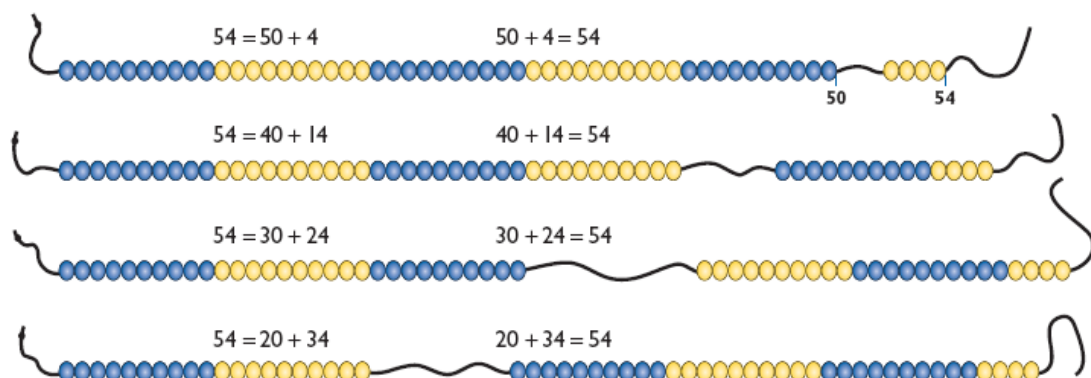
Through modelling and discussion, explore how this can be represented as $46-18$ and that complementary addition (counting on) can be a useful checking strategy.



Many mental strategies are taught. Children are taught to recognise that when numbers are close together, it is more efficient to **count on** the difference. Children should be encouraged to decide which strategy to use depending on the numbers involved. They need to be clear about the relationship between addition and subtraction.

Towards a standard written method (preparation for key stage 2)

In preparation for understanding decomposition and division strategies taught in key stage 2, it is important that children gain experience of partitioning beyond simple tens and ones, e.g.



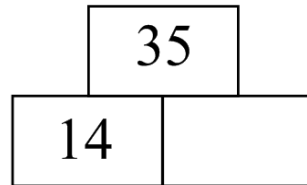
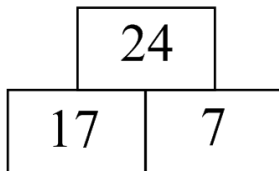
and

$$\begin{pmatrix} 50 \\ 54 \\ 4 \end{pmatrix} \quad \text{or} \quad \begin{pmatrix} 40 \\ 54 \\ 14 \end{pmatrix} \quad \text{or} \quad \begin{pmatrix} 30 \\ 54 \\ 24 \end{pmatrix} \quad \dots \text{etc}$$

Inverse relationship

Children know that addition and subtraction are inverse operations and can state the subtraction calculation corresponding to a given addition calculation and vice versa.

They check their answers; for example, to confirm $24 - 7 = 17$, they add 17 and 7.



$14 + \square = 35$. What is the missing number? How do you know? What subtraction could you do to find the answer?

Year 3



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

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.

☐ Counting up differences as a mental strategy when numbers are close together or near multiples of 10 (see examples above)

☐ Read and write numbers up to 1000 in numerals and words.

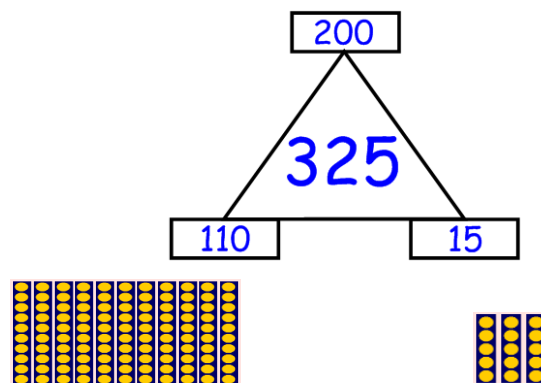
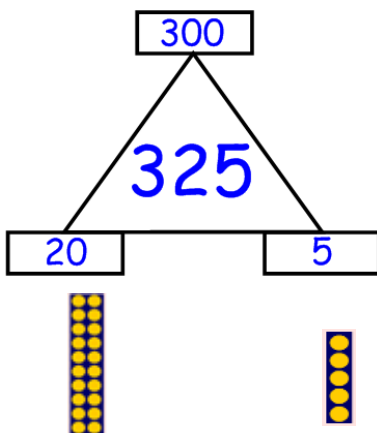
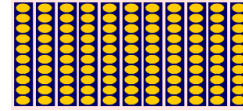
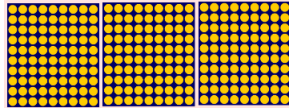
☐ Practise mental subtraction strategies, such as subtracting near multiples of 10 and adjusting (e.g. subtracting 19 or 21), and select most appropriate methods to subtract, explaining why.

☐ Use counting up as an informal written strategy for subtracting pairs of three-digit numbers,

☐ Begin to use partitioning for expanded columnar addition,

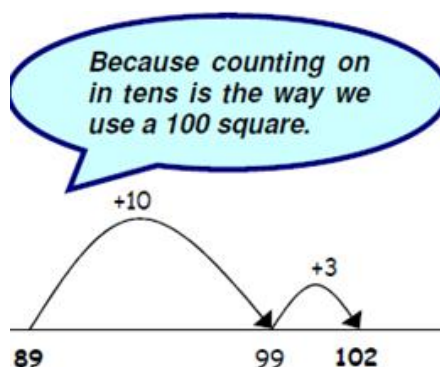
- Subtracting with 2 and 3-digit numbers

Children must continue to develop their understanding of partitioning beyond hundreds, tens and ones, e.g. 325 can be partitioned in a variety of ways, such as $325 = 300 + 10 + 15 = 200 + 110 + 15$... etc

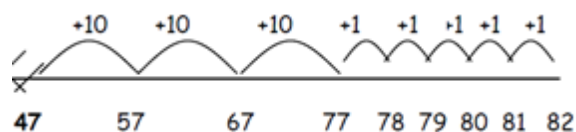


Continue to count back.

Continue to reinforce counting on as a strategy for numbers which are close together (e.g. 121-118) and also for numbers that are near multiples of 10, 100, 100 or £s etc).



Start with the smallest number and count on in tens. Finally count on the remaining ones.



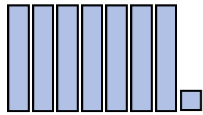
Introduce the partitioned method where no exchanging is required.

$$89 - 35 = 54$$

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

$$\begin{array}{r} 50 + 4 = 54 \end{array}$$

Introduce 'exchanging' through practical subtraction. Make the larger numbers with Base 10 or Cuisenaire. Then subtract 47 from it.



Before subtracting 7 they will need to exchange a row of 10 units. Then subtract 7, and subtract 4 tens.

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

When learning to 'exchange', explore 'partitioning in different ways so that pupils understand that when you exchange the value stays the same ie $72 = 70 + 2 = 60 + 12 = 50 + 22$. Emphasise that the value hasn't changed; we have just partitioned it in a different way

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

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

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

Year 4



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

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

Use expanded column subtraction for 3-digit and 4-digit numbers

Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100

E.g. 2002 - 1865 is

Subtract like fractions, e.g. $\frac{1}{4} + \frac{1}{8} = \frac{3}{8}$

Use fractions that add to 1 to find fraction complements to 1, e.g. $1 - \frac{2}{3} = \frac{1}{3}$

- Subtract up to 4-digit numbers.
- Children continue to check a calculation to see if they can carry out it out mentally.
- A variety of mental strategies must be taught and practised, including counting on to find the difference where numbers are closer together, or where it is easier to count back. See previous for methods.
- Partitioned column subtraction with „exchanging“ (decomposition):

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

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

Subtracting money: partition into £1 + 30 + 5

Children should then move to a more compact method

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

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

Give opportunities to apply this method to money

Always encourage children to consider the best method for the numbers involved—mental, counting on, counting back or writ-ten method.



Approximate,
Calculate,
Check it mate!

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

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 in-tegers through 0.
 - ▣ Round any number up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.
- Use compact or expanded column subtraction to subtract numbers with up to 5 digits.

Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000.

Use complementary addition for subtractions of decimals with up to two places incl. amounts of money

Begin to subtract related fractions using equivalences. (E.g. $\frac{1}{2} - \frac{1}{6} = \frac{2}{6}$)

Choose the most efficient method in any given situation

Subtract with at least 4-digit numbers: including money, measure and decimals.

Children use the column compact method, with exchanging.

$$\begin{array}{r}
 \overset{2}{\cancel{3}} \overset{10}{\cancel{1}} \overset{0}{\cancel{0}} \overset{4}{\cancel{5}} \overset{6}{\cancel{6}} \\
 - \quad \quad 2 \quad 1 \quad 2 \quad 8 \\
 \hline
 2 \quad 8, \quad 9 \quad 2 \quad 8
 \end{array}$$

Only move to this method when children are secure with number facts and place value. Children who are not secure will need to remain on the partitioned method.

Subtract with larger integers

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

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

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

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

Year 6



Approximate,
Calculate,
Check it mate!

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

Key skills for subtraction at Y6:

- ☐ Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
 - ☐ Read, write, order and compare numbers up to 10 million and determine the value of each digit
 - ☐ Round any whole number to a required degree of accuracy
 - ☐ Use negative numbers in context, and calculate intervals
 - ☐ across zero.
 - ☐ Children need to utilise and consider a range of mental subtraction strategies, jottings and written methods before choosing how to calculate.
- Use column subtraction to subtract numbers with up to 6 digits.

Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10,000.

Use complementary addition for subtractions of decimal numbers with up to three places including money.

Subtract mixed numbers and fractions with different denominators

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.

- Subtracting with increasingly large and more complex numbers and decimal values.

	9	5	10	6	9	9
-		8	9	9	4	9
		6	0	7	5	0

Continue to use the compact method of subtraction for more complex integers.

	10	5	.	4	1	9	kg
-		3	6	.	0	8	kg
		6	9	.	3	3	9 kg

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

Empty decimal place can be filled with a zero.