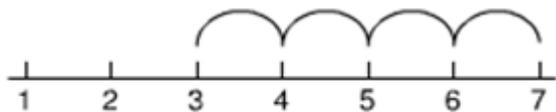


# SUBTRACTION

## Stage 1 Subtract from numbers up to 20

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



$$7 - 4 = 3$$



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



7



4

This will be introduced practically with the language "find the distance between" and "how many more?" in a range of 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 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 Stage 1:**

- 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.

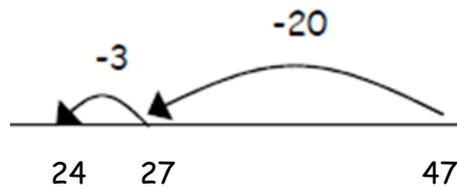
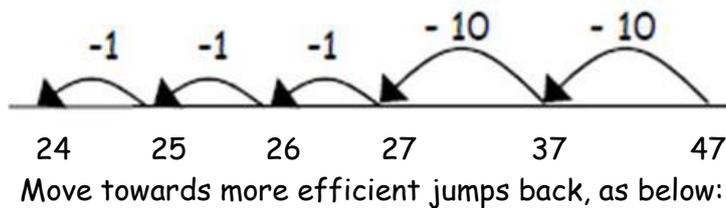
## Stage 2 Subtract with 2-digit numbers

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

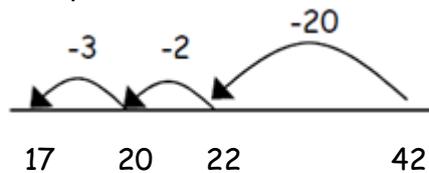
This strategy will be used for:

- **2-digit numbers subtract units** (by taking away / counting back) e.g. 36—7
- **2-digit numbers subtract tens** (by taking away / counting back) e.g. 48—30
- **Subtracting pairs of 2-digit numbers** (see below:)

$$47 - 23 = 24 \text{ Subtract tens first, then units}$$



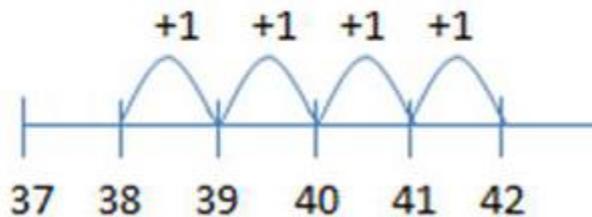
Teaching children to **bridge through ten** can help them to become more efficient, for example  $42 - 25$ :



Mental strategy - subtract numbers close together by **counting on**:

Start with the smaller number and count on to the largest e.g.

$$42 - 38 = 4$$



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. They need to be clear about the relationship between addition and subtraction.

**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 Stage 2:**

- 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, 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.

## Stage 3 Subtracting with 2 and 3-digit numbers

Introduce **partitioned column subtraction** method:

**STEP 1:** introduce this method with examples where **no exchanging** is required.

$$89 - 35 = 54$$

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

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

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

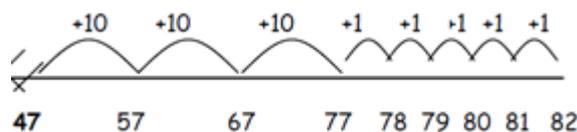
**STEP 3:** Once pupils are secure with the understanding of "exchanging", they can use the partitioned column method to subtract any 2 and 3-digit numbers.

2	3	8	-	1	4	6	=	9	2
$\begin{array}{r} \phantom{100} \\ \cancel{200} + 30 + 8 \\ - 100 + 40 + 6 \\ \hline 0 + 90 + 2 \end{array}$									

**Counting on** as a mental strategy for subtraction:

Continue to reinforce counting on as a strategy for **close-together numbers** (e.g. 121–118), and also for numbers that are "nearly" multiples of 10, 100, 1000 or £s, which make it easier to count on (e.g. 102–89, 131–79, or calculating change from £1 etc.).

Start at the smaller number and count on in **tens** first, then count on in units to find the rest of the difference:



**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 Stage 3:**

- 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.

## Stage 4 Subtract with up to 4-digit numbers

Partitioned column subtraction with "exchanging" (decomposition):

2	7	5	4	-	1	5	6	2	=	1	1	9	2
2	0	0	0	+	<del>7</del>	0	0	+	5	0	+	4	
-	1	0	0	+	5	0	0	+	6	0	+	2	
	1	0	0	+	1	0	0	+	9	0	+	2	

Move from this to compact column subtraction:

	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.

Also give plenty of opportunities to apply this to money and measures; and always encourage children to consider the best method for the numbers involved - mental, counting on, counting back or written method.

### Mental strategies:

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 on.

**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 Stage 4:**

- 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.

## Stage 5 Subtract with at least 4-digit numbers

Compact column subtraction (with "exchanging").

	<del>2</del> <sup>2</sup>	<del>8</del> <sup>10</sup>	<del>1</del> <sup>0</sup>	<del>2</del> <sup>8</sup>	<del>8</del> <sup>6</sup>
-		2	1	2	8
	<hr/>				
	2	8	9	2	8

Subtract with decimal values, including mixtures of integers and decimals, aligning the decimal point, adding a "zero" in any empty decimal places to aid understanding of what to subtract in that column.

	<del>7</del> <sup>6</sup>	<del>1</del> <sup>10</sup>	<del>6</del> <sup>8</sup>	<del>9</del> <sup>6</sup>	.	<del>0</del> <sup>0</sup>
-		3	7	2	.	5
	<hr/>					
	6	7	9	6	.	5

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

**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 Stage 5:**

- 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 zero.
- Round any number up to 1 million to the nearest 10, 100, 1000, 10,000 and 100,000.

## Stage 6 Subtracting with increasingly large and more complex numbers and decimal values

Using the compact column method to subtract more complex integers:

$$\begin{array}{r}
 \cancel{7}^{\text{h}} \cancel{5}^{\text{t}} \cancel{0}^{\text{h}}, 699 \\
 - \quad 89,949 \\
 \hline
 60,750
 \end{array}$$

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

$$\begin{array}{r}
 \cancel{7}^{\text{h}} \cancel{0}^{\text{t}} 5 \cdot 419 \text{ kg} \\
 - \quad 36 \cdot 08 \text{ kg} \\
 \hline
 69 \cdot 339 \text{ kg}
 \end{array}$$

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

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 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 Stage 6:**

- 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.