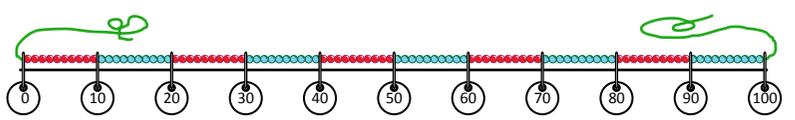


Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that $6 + [] = 10$ and $10 - 6 = []$ are seen as ways of expressing the same question.

+ Addition

Using place value

Count on in ones/counting in tens, e.g. knowing $45 + 1$ or $45 + 10$ without counting on in ones.



$45 + \square = 50$ $65 + \square = 70$

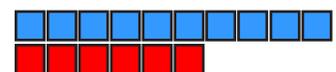
$85 + \square = 90$

Counting on

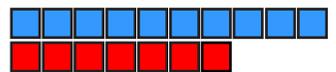
Count on in ones, e.g. $11 + 2 =$ and $7 + 4 =$
 Count on in tens, e.g. $45 + 20$ as $45, 55, 65$

Using number facts

'Story' of 4, 5, 6, 7, 8 and 9, e.g. $7 = 7 + 0$ or $6 + 1$ or $5 + 2$ or $4 + 3$.
 Number bonds to 10, e.g. $5 + 5$, $6 + 4$, $7 + 3$, $8 + 2$, $9 + 1$, $10 + 0$.



$6 + \square = 10$



$7 + \square = 10$



$5 + \square = 10$



$9 + \square = 10$

Patterns using known facts, e.g. $4 + 3 = 7$ so we know $24 + 3$, $44 + 3$, $74 + 3$, etc.

- Subtraction

Using place value

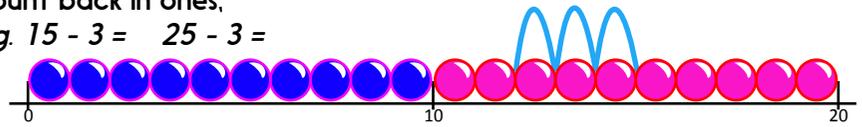
Count back in 1s/Count back in 10s.
 Say one less than any number to 100.
 Say 10 less without counting back in ones.

1	2	3	4	5
11	12	13	14	15
21	22	23	24	25
31	32	33	34	35
41	42	43	44	45

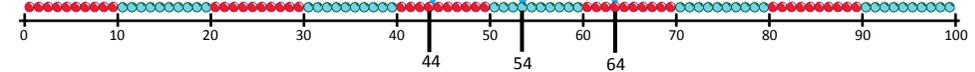
$33 - 10 = 23$

Subtracting by taking away

Count back in ones, e.g. $15 - 3 =$ $25 - 3 =$

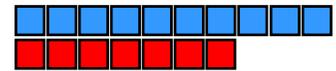


Count back in tens.



Using number facts

'Story' of 4, 5, 6, 7, 8 and 9, e.g. $7 - 1 = 6$, $7 - 2 = 5$, $7 - 3 = 4$, etc.
 Number bonds to 10, e.g. $10 - 1 = 9$, $10 - 2 = 8$, $10 - 3 = 7$, etc.



$10 - \square = 7$

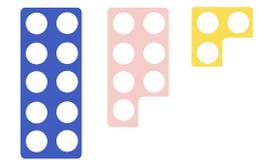


$10 - \square = 9$

Bead strings and 1-100 number grid help counting on/back in tens.

Missing number sentences, $3 + [] = 7$, link addition and subtraction.

Patterns using known facts, e.g. $10 - 7 = 3$ so we know $30 - 7 = ?$



Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that $6 + [] = 10$ and $10 - 6 = []$ are seen as ways of expressing the same question.

+ Addition

Using place value

Know 1 more or 10 more than any number, e.g. 1 more than 67 or 10 more than 85.

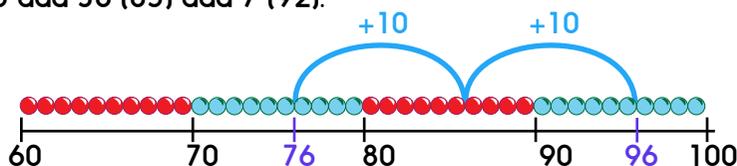
Partitioning, e.g. $55 + 37$ as $50 + 30$ and $5 + 7$ finally combining the two totals: $80 + 12$.

$$\begin{array}{r} 50 + 30 = 80 \\ 5 + 7 = 12 \\ \hline 80 + 12 = 92 \end{array}$$

Bead strings and 1-100 number grid help counting on/back in tens.

Counting on

Add ten and multiples of ten, e.g. $76 + 20$ as $76, 86, 96$ or in one hop $76 + 20 = 96$. Add two 2-digit numbers by counting on in tens and then in ones, e.g. $55 + 37$ as 55 add 30 (85) add 7 (92).

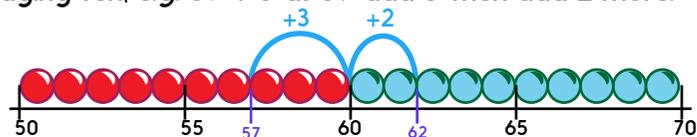


Add near multiples, e.g. $46 + 19$ or $63 + 21$.

Using number facts

Know pairs of numbers which make the numbers up to and including 10, e.g. $8 = 4 \& 4, 3 \& 5, 2 \& 6, 1 \& 7$ and $10 = 5 \& 5, 4 \& 6, 3 \& 7, 2 \& 8, 1 \& 9, 0 \& 10$. Patterns of known facts, e.g. $6 + 3 = 9$, so we know $36 + 3 = 39$, $66 + 3 = 69$, $53 + 6 = 59$.

Bridging ten, e.g. $57 + 5$ as 57 add 3 then add 2 more.



Adding three or more single-digit numbers, spotting bonds to 10 or doubles, e.g. $6 + 7 + 4 + 2$ as $10 + 7 + 2$.

Missing number sentences, $3 + [] = 7$, link addition and subtraction.

- Subtraction

Using place value

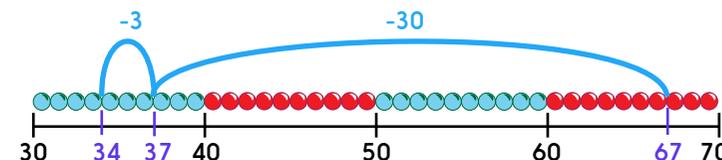
Know 1 less or 10 less than any number, e.g. 1 less than 74 or 10 less than 82.

Partitioning, e.g. $55 - 32$ as $50 - 30$ and $5 - 2$ combining the answers: $20 + 3$.

$$\begin{array}{r} 50 - 30 = 20 \\ 5 - 2 = 3 \\ \hline 55 - 32 = 23 \end{array}$$

Taking away

Subtract ten and multiples of ten, e.g. $76 - 20$ as $76, 66, 56$ or in one hop $76 - 20 = 56$. Subtract two 2-digit numbers by counting back in tens then in ones, e.g. $67 - 33$ as 67 subtract 30 (37) then count back 3 (34).

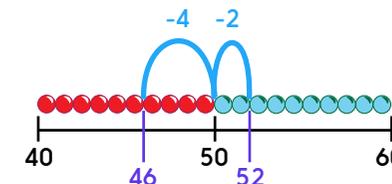


Subtracting near multiples, e.g. $74 - 21$ or $57 - 19$.

Using number facts

Know pairs of numbers which make the numbers up to and including 10, e.g. $10 - 6 = 4, 8 - 3 = 5, 5 - 2 = 3$, etc. Patterns of known facts, e.g. $9 - 6 = 3$, so we know $39 - 6 = 33, 69 - 6 = 63, 89 - 6 = 83$.

Bridge ten, e.g. $52 - 6$ as 52 subtract 2 then subtract 4 more.



Counting up

Find a difference between two numbers on a line, e.g. $51 - 47$.

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+ Addition

Using place value

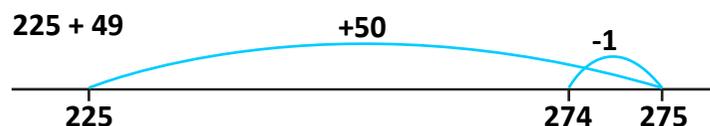
Count in hundreds, e.g. knowing $475 + 200$ as 475, 575, 675.

Add multiples of 10, 100 and £1,
e.g. $746 + 200$ or $746 + 40$ or
 $£6.34 + £5$ as $£6 + £5$ and 34p.

Partitioning, e.g. $68 + 74$ as $60 + 70$ and $8 + 4$ and
combine the totals: $130 + 12 = 142$
Or $£8.50 + £3.70$ as $£8 + £3$ and $50p + 70p$ and combine: $£11 + £1.20$.

Counting on

Add 2-digit numbers by adding the multiple of ten then the ones,
e.g. $67 + 55$ as 67 add 50 (117) add 5 (122).
Add near multiples of 10 and 100, e.g. $67 + 39$ or $364 + 199$.



Count on from 3-digit nos, e.g. $247 + 34$ as $247 + 30$ (277)
then $277 + 4 = 281$.

Using number facts

Number bonds to 100, e.g. $35 + 65$, $46 + 54$, $73 + 27$, etc.

100	
65	35

Add to next ten and next hundred, e.g. $176 + 4 = 180$, $435 + 65 = 500$, etc.

- Subtraction

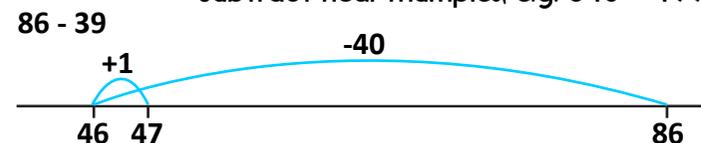
Taking away

Use place value to subtract, e.g. $358 - 300$ or $348 - 40$ or $348 - 8$.
Taking away multiples of 10, 100 and £1, e.g. $476 - 40 = 436$,
 $476 - 300 = 176$, $£4.76 - £2 = £2.76$.

Partitioning, e.g. $68 - 42$ as $60 - 40$ and $8 - 2$ or
 $£6.84 - £2.40$ as $£6 - £2$ and $80p - 40p$.

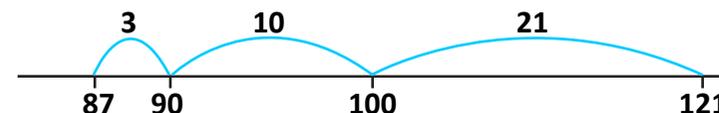
Count back in hundreds, tens and then ones,
e.g. $763 - 121$ as $763 - 100$ (663) then subtract 20 (643)
then subtract 1 (642).

Subtract near multiples, e.g. $648 - 199$ or $86 - 39$.



Counting up

Find a difference between two numbers by counting up from the smaller
to the larger, e.g. $121 - 87$.



Using number facts

Number bonds to 100, e.g. $100 - 35 = 65$, $100 - 48 = 52$, etc.

100	
48	?

Subtraction is both taking away and - importantly - difference.

We no longer count in 1s but use PV and number facts.

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+ Written Addition

Written methods

Build on partitioning to develop expanded column addition with two 3-digit numbers.

$$\begin{array}{r} 400 \quad 60 \quad 6 \\ + 300 \quad 50 \quad 8 \\ \hline 700 \quad 110 \quad 14 \end{array}$$

Expanded column addition with 'carrying'.

$$\begin{array}{r} 400 \quad 60 \quad 6 \\ + 300 \quad 50 \quad 8 \\ \hline 100 \quad 10 \\ \hline 800 \quad 20 \quad 4 \end{array}$$

Compact column addition with two or more 3-digit numbers or towers of 2-digit numbers.

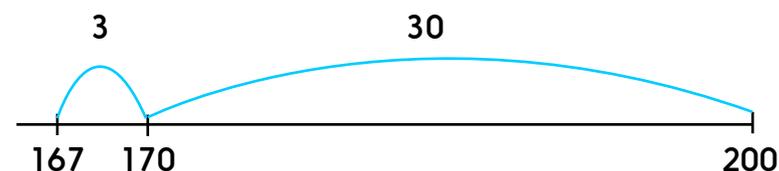
$$\begin{array}{r} 347 \\ + 286 \\ + 495 \\ \hline 21 \\ \hline 1128 \end{array}$$

Compact column addition with 3-digit numbers

Recognise fractions which add to 1, e.g. $\frac{1}{4} + \frac{3}{4}$ or $\frac{2}{5} + \frac{3}{5}$.

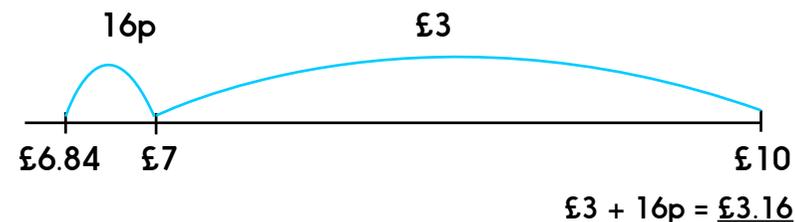
- Written Subtraction

Develop counting up subtraction.



Counting up subtraction is a crucial mental strategy.

Use counting up subtraction to find change from £1 and £10.



Recognise complements of any fraction to 1, e.g. $1 - \frac{1}{4} = \frac{3}{4}$ or $1 - \frac{2}{3} = \frac{1}{3}$.

Important to see the visual image of fractions totalling one whole.

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+ Addition

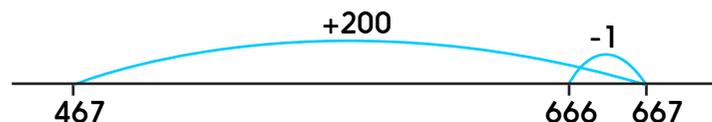
Using place value

Count in thousands, e.g. knowing $475 + 200$ as 475, 575, 675.
Partitioning, e.g. $746 + 203$ as $700 + 200$ and $46 + 3$
or $134 + 707$ as $130 + 700$ and $4 + 7$.

PV and number facts are central to mental strategies.

Counting on

Add 2-digit numbers by adding the multiple of ten then the ones, e.g. $67 + 55$ as 67 add 50 (117) add 5 (122).
Add near multiples of 10, 100 and 1000, e.g. $467 + 199$ or $3462 + 2999$.



Count on to add 3-digit numbers and money, e.g. $463 + 124$ as $463 + 100$ (563) $+ 20$ (583) $+ 4 = 587$ or $£4.67 + £5.30$ as $£9.67$ add 30p.

Using number facts

Number bonds to 100 and to next multiple of 100, e.g. $463 + 37$, $1353 + 47$.

Number bonds to £1 and to the next whole pound, e.g. $£3.45 + 55p$.
Add to the next whole number, e.g. $4.6 + 0.4$ or $7.2 + 0.8$.

Counting up is essential for money calculations and, later, decimals.

- Subtraction

Taking away

Use place value to subtract, e.g. $4748 - 4000$ or $4748 - 8$, etc.

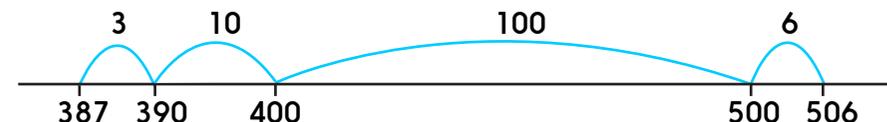
Take away multiples of 10, 100, 1000, £1, 10p or 0.1, e.g. $8392 - 50$ or $6723 - 3000$ or $£3.74 - 30p$ or $5.6 - 0.2$.

Partitioning, e.g. $£5.87 - £3.04$ as $£5 - £3$ and $7p - 4p$ or $7493 - 2020$ as $7000 - 2000$ and $90 - 20$.

Count back, e.g. $6482 - 1301$ as $6482 - 1000$, then $- 300$, then $- 1$ (5181).
Subtract near multiples, e.g. $3522 - 1999$ or $£34.86 - £19.99$.

Counting up

Find a difference between two numbers by counting up from the smaller to the larger, e.g. $506 - 387$.



$100 + 10 + 6 + 3 = \underline{119}$

Using number facts

Number bonds to 10, 100 and derived facts, e.g. $100 - 76 = 24$, $1.0 - 0.6 = 0.4$.

100	
76	24

Number bonds to £1 and £10, e.g. $£1.00 - 86p = 14p$ or $£10 - £3.40 = £6.60$.

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+ Written Addition

Build on expanded column addition to develop compact column addition with larger numbers.

$$\begin{array}{r} 1000 \ 400 \ 60 \ 8 \\ + 4000 \ 800 \ 60 \ 6 \\ \hline 1000 \ 100 \ 10 \\ \hline 6000 \ 300 \ 30 \ 4 \end{array}$$

Expanded methods firm up a robust understanding of place value.

Compact column addition with larger numbers.

$$\begin{array}{r} 5347 \\ 2286 \\ + 1495 \\ \hline 121 \\ \hline 9128 \end{array}$$

Use expanded and compact column addition to add amounts of money, e.g. £3.24 + £2.58.

$$\begin{array}{r} \text{£}3 \ 20\text{p} \ 4\text{p} \\ \text{£}2 \ 50\text{p} \ 8\text{p} \\ \hline \text{£}5 \ 70\text{p} \ 12\text{p} \ \text{£}5.82 \end{array} \quad \begin{array}{r} \text{£}3.24 \\ + \text{£}2.58 \\ \hline \text{£}5.82 \end{array}$$

Add like fractions, e.g. $\frac{3}{8} + \frac{1}{8} + \frac{1}{8}$.

- Written Subtraction

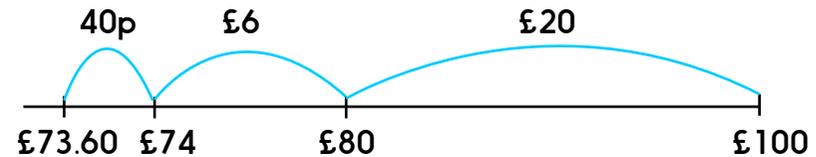
Expanded column subtraction.

$$\begin{array}{r} 600 \ 110 \ 16 \\ \cancel{700} \ \cancel{20} \ \cancel{6} \\ - 300 \ 50 \ 8 \\ \hline 300 \ 60 \ 8 \end{array}$$

Begin to use column subtraction.

$$\begin{array}{r} 6 \ 11 \ 16 \\ \cancel{7} \ \cancel{2} \ \cancel{6} \\ - 3 \ 5 \ 8 \\ \hline 3 \ 6 \ 8 \end{array}$$

Use counting up subtraction to find change from £10, £20, £50 and £100, e.g. £100 - £73.60.



$$\text{£}20 + \text{£}6 + 40\text{p} = \underline{\text{£}26.40}$$

Subtract like fractions, e.g. $\frac{3}{8} - \frac{1}{8} = \frac{2}{8}$.

Stress that decimals and fractions are parts of a whole.

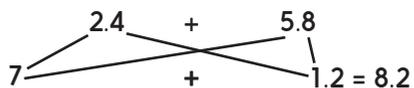
Addition and subtraction are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using + and two using -) which can be written to express the relationship between 4 and 6 and 10. It is key to a good understanding of addition and subtraction that $6 + [] = 10$ and $10 - 6 = []$ are seen as ways of expressing the same question.

+ Addition

Using place value

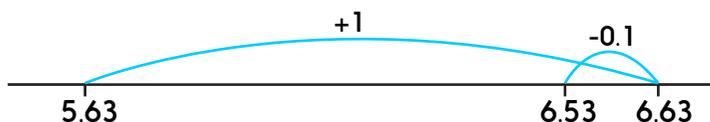
Count in 0.1s, 0.01s, e.g. knowing what 0.1 more than 0.51 is.

Partitioning, e.g. $2.4 + 5.8$ as $2 + 5$ and $0.4 + 0.8$ and combine the totals: $7 + 1.2 = 8.2$.



Counting on

Add two decimal numbers by adding the ones then the tenths/hundredths, e.g. $5.72 + 3.05$ as 5.72 add 3 (8.72) then add 0.05 (8.77).
Add near multiples of 1, e.g. $6.34 + 0.99$ or $5.63 + 0.9$.

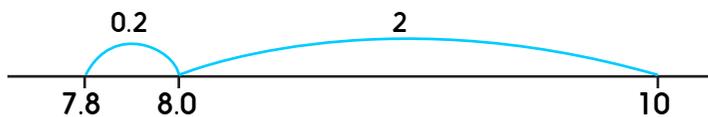


Count on from large numbers, e.g. $6834 + 3005$ as $9834 + 5$.

Using number facts

Number bonds to 1 and to the next whole number, e.g. $0.4 + 0.6$ or $5.7 + 0.3$.

Add to the next ten from a decimal number, e.g. $7.8 + 2.2 = 10$.



$$2 + 0.2 = \underline{2.2}$$

Subtracting by counting up is much less error prone.

Knowledge of number bonds underpins mental strategies.

- Subtraction

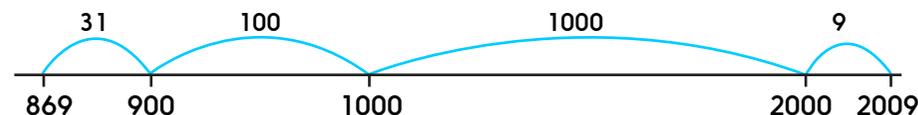
Taking away

Using place value to subtract decimals, e.g. $4.58 - 0.08$ or $6.26 - 0.2$, etc.
Take away multiples of powers of 10, e.g. $15,672 - 300$ or $4.82 - 2$ or $2.71 - 0.5$ or $4.68 - 0.02$.

Partition or count back, e.g. $3964 - 1051$ or $5.72 - 2.01$.
Subtract near multiples, e.g. $86,456 - 9999$ or $3.58 - 1.99$.

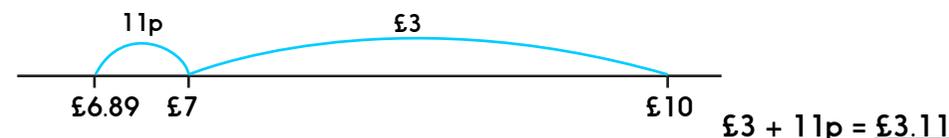
Counting up

Find a difference between two numbers by counting up from the smaller to the larger, e.g. $2009 - 869$.



$$1000 + 100 + 31 + 9 = \underline{1140}$$

Find change using shopkeepers' addition, e.g. buy toy for £6.89 using £10.



Using number facts

Derived facts from number bonds to 10 and 100, e.g. $2 - 0.45$ using $45 + 55 = 100$ or $3.00 - 0.86$ using $86 + 14 = 100$.

100	
86	14

Number bonds to £1, £10 and £100, e.g. $£4.00 - £3.86p = 14p$ or $£100 - £66$ using $66 + 34 = £100$.

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+ Addition

Using place value

Count in 0.1s, 0.01s, 0.001s, e.g. knowing what 0.001 more than 6.725 is.
Partitioning, e.g. $9.54 + 3.25$ as $9 + 3$ and $0.5 + 0.2$ and $0.04 + 0.05$ to get 12.79.

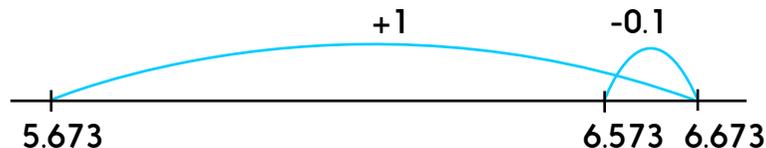
10s	1s	.	0.1s	$\frac{1}{10}$ s	0.01s	$\frac{1}{100}$ s
	9	.	5		4	
	3	.	2		5	
1	2	.	7		9	

Subtracting by counting up is much less error prone.

Counting on

Add two decimal numbers by adding the ones then the tenths/hundredths or thousandths, e.g. $6.314 + 3.006$ as 6.314 add 3 (9.314) then add 0.006 (9.32).

Add near multiples of 1, e.g. $6.345 + 0.999$ or $5.673 + 0.9$.



Count on from large numbers, e.g. $16,375 + 12,003$.

Using number facts

Number bonds to 1 and to the next multiple of 1, e.g. $0.63 + 0.37$ or $2.355 + 0.645$.
Add to next ten, e.g. $4.62 + 0.38$.

5	
4.62	?

Knowledge of number bonds underpins mental strategies.

- Subtraction

Taking away

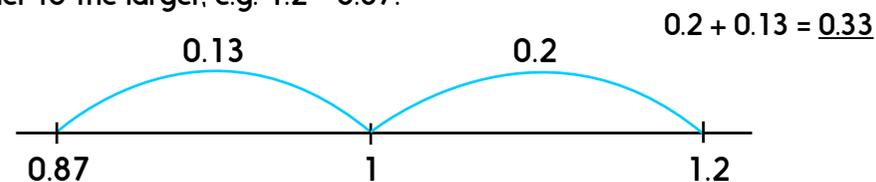
Use place value to subtract decimals, e.g. $7.782 - 0.08$ or $16.263 - 0.2$, etc.
Take away multiples of powers of 10, e.g. $132,956 - 400$ or $686,109 - 40,000$ or $7.823 - 0.5$.

Partition or count back, e.g. $3964 - 1051$ or $5.72 - 2.01$.

Subtract near multiples, e.g. $360,078 - 99,998$ or $12.831 - 0.99$.

Counting up

Count up to subtract numbers from multiples of 10, 100, 1000, 10,000
Find a difference between two decimal numbers by counting up from the smaller to the larger, e.g. $1.2 - 0.87$.



Using number facts

Derived facts from number bonds to 10 and 100, e.g. $0.1 - 0.075$ using $75 + 25 = 100$ or $5 - 0.65$ using $65 + 35 = 100$.

Number bonds to £1, £10 and £100, e.g. $£7.00 - £4.37$ or $£100 - £66.20$ using $20p + 80p = £1$ and $£67 + £33 = £100$.

£100	
£67	£33

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+ Written Addition

Compact column addition for adding several large numbers and decimals with up to two places.

Compact column addition with money.

$\pounds 14.64$	$\pounds 14$	60p	4p	
$+$ $\pounds 28.78$	$\pounds 28$	70p	8p	
$+$ $\pounds 12.26$	$+$ $\pounds 12$	20p	6p	
$\underline{11.1}$	$\underline{\pounds 1}$	$\underline{10\text{p}}$		
$\pounds 55.68$	$\pounds 55$	60p	8p	$\pounds 55.68$

Adding fractions with unlike denominators,

e.g. $\frac{3}{4} + \frac{1}{3} = 1 \frac{1}{12}$ or $2 \frac{1}{4} + 1 \frac{1}{3} = 3 \frac{7}{12}$

$$\begin{aligned} \frac{3}{4} + \frac{1}{3} &= \frac{9}{12} + \frac{4}{12} \\ &= \frac{13}{12} \\ &= 1 \frac{1}{12} \end{aligned}$$

Children must be able to do expanded as well as compact to show understanding.

Understanding equivalent fractions is absolutely key here.

- Written Subtraction

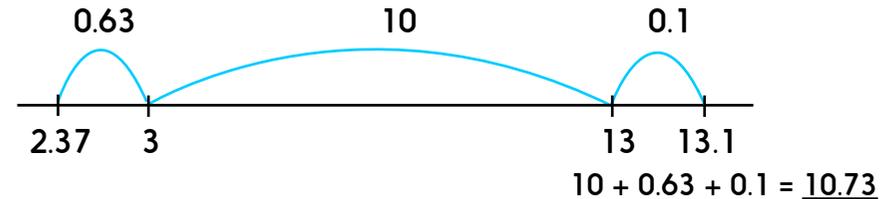
Compact column subtraction for large numbers.

$$\begin{array}{r} 214715 \\ - 34688 \\ \hline 16458 \\ \hline 18227 \end{array}$$

Use counting up subtraction when dealing with money, e.g. $\pounds 100 - \pounds 78.56$ or $\pounds 45.23 - \pounds 27.57$.



Use counting up subtraction to subtract decimal numbers, e.g. $13.1 - 2.37$.



Subtracting fractions with unlike denominators,

$$\begin{aligned} \text{e.g. } 1\frac{1}{4} - \frac{2}{3} &= \frac{5}{4} - \frac{2}{3} \\ &= \frac{15}{12} - \frac{8}{12} \\ &= \frac{7}{12} \end{aligned}$$