

Year 1

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 $6 + \square = 10$ and $10 - 6 = \square$ 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.



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

$$85 + \square = 90$$

Counting on

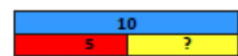
Count on in ones, e.g. $11 + 2 =$ and $7 + 4 =$
Count on in tens, e.g. $45 + 20$ as 45, 55, 65

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. $5 + 5$, $6 + 4$, $7 + 3$, $8 + 2$, $9 + 1$, $10 + 0$.



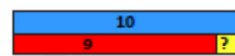
$$6 + \square = 10$$



$$5 + \square = 10$$



$$7 + \square = 10$$



$$9 + \square = 10$$

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

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

- Subtraction

Using place value

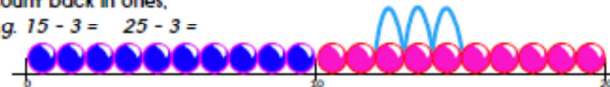
Count back in 1s/Count back in 10s.
Say one less than any number to 100.
Say 10 less without counting back in ones.

$$33 - 10 = 23$$

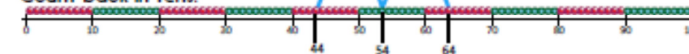
1	2	3	4	5
11	12	13	14	15
21	22	23	24	25
31	32	33	34	35
41	42	43	44	45

Subtracting by taking away

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



Count back in tens.

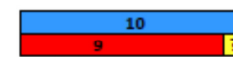


Using number facts

'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.



$$10 - \square = 7$$



$$10 - \square = 9$$

Missing number sentences, $3 + \square = 7$, link addition and subtraction.

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



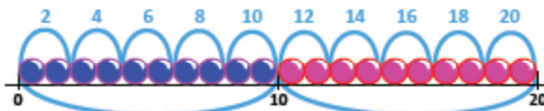
Year 1

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using \times and two using \div which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that $[] \times 5 = 45$ and $45 \div 5 = []$ are seen as ways of expressing the same question.

\times Multiplication

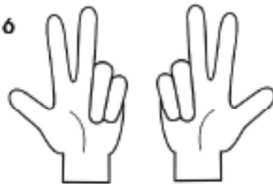
Counting in steps ('Clever' counting)

Count in 2s and 10s.



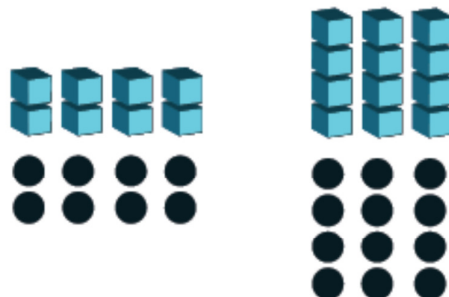
Doubling and halving

Find doubles to double 6 using fingers.



Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to '3 lots of 4' or '2 lots of 5', etc.



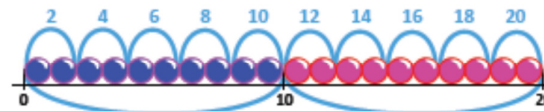
'Clever' counting is an excellent basis for multiplication and division.

Division must be presented as the inverse of multiplication (grouping).

\div Division

Counting in steps ('Clever' counting)

Count in 2s, and 10s.



Doubling and halving

Find half of even numbers up to 12 including realising that it is hard to halve an odd number.



Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to 'how many towers of 3 can I make with 12 cubes?'

Sharing

Begin to find half of a quantity using sharing, e.g. half of 16 cubes by giving one each repeatedly to two children.



Year 2

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.

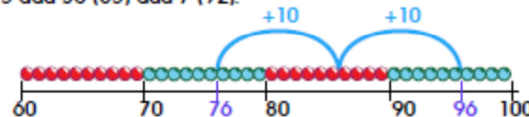
Partitioning, e.g. $55 + 37$ as $50 + 30$ and $5 + 7$ finally combining the two totals: $80 + 12$.

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

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).

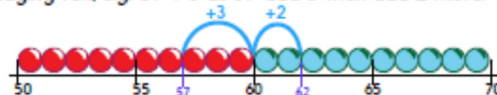


Add near multiples, e.g. $46 + 19$ or $63 + 21$.

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

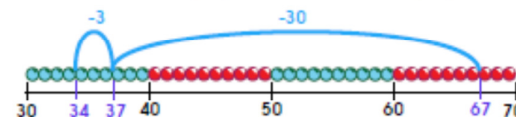
Know 1 less or 10 less than any number, e.g. 1 less than 74 or 10 less than 82.

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

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

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).

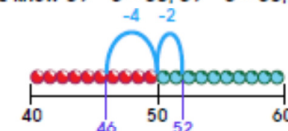


Subtracting near multiples, e.g. $74 - 21$ or $57 - 19$.

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. $51 - 47$.

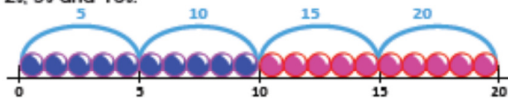
Year 2

Multiplication and division are inverse operations. Right from the start children should be taught these as related operations. There are four number sentences (two using \times and two using \div) which can be written to express the relationship between 5 and 9 and 45. It is key to a good understanding of division that $\square \times 5 = 45$ and $45 \div 5 = \square$ are seen as ways of expressing the same question.

\times Multiplication

Counting in steps ('Clever' counting)

Count in 2s, 5s and 10s.



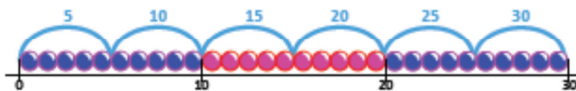
Begin to count in 3s.

Doubling and halving

Begin to know doubles of multiples of 5 to 100.
e.g. double 35 is 70.

Grouping

Use arrays to find answers to multiplication and relate to 'clever' counting.
e.g. 3×4 as three lots of four things
and 6×5 as six steps in the 5s count
as well as six lots of five.



Understand that 5×3 can be worked out as three 5s or five 3s.

Use number facts

Know doubles to double 20

$$\text{Double } 7 = 14$$



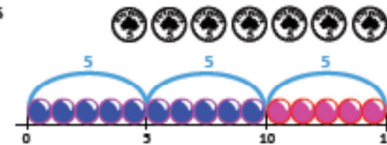
Start learning 2x, 5x, 10x tables, relating these to 'Clever counting' in 2s, 5s, and 10s, e.g. $5 \times 10 = 50$, and 10, 20, 30, 40, 50 is five steps in the tens count.

Division, grouping, is the inverse of multiplication.

\div Division

Counting in steps ('Clever' counting)

Count in 2s, 5s and 10s



Doubling and halving

Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a $\frac{1}{2}$.

Begin to know half of multiples of 10 to 100, e.g. half of 70 is 35.

Grouping

Relate division to multiplication by using arrays of towers of cubes to find answers to division, e.g. how many towers of five cubes can I make from 20 cubes as $\square \times 5 = 20$ and also as $20 \div 5 = ?$



Relate division to 'clever' counting and hence to multiplication, e.g. how many 5s do I count to get to 20?

Sharing

Begin to find half or a quarter of a quantity using sharing, e.g. $\frac{1}{4}$ of 16 cubes by sorting the cubes into four piles.

Find $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ of small quantities.

Using number facts

Know halves of even numbers to 24.

Know 2x, 5x and 10x division facts.

Begin to know 3x division facts.

half of 20 is...

20	
?	?