



Practical and written methods

Pupils should be taught to:

- read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$

Pupils should use real objects and apparatus to develop the concepts of addition and subtraction. They use a wide range of objects and use calculation in a range of contexts to develop a broad understanding and fluency in their skills. Talking about what they are doing with peers and adults is a very important part of the process of developing concepts. Addition and subtraction are explored as related operations

Understanding addition as combining two sets of objects

- Use games, songs and practical activities to develop understanding of addition in a wide range of different contexts and develop the vocabulary of addition.
- Support children to make a record in pictures, words or symbols, of addition activities.



- Construct number sentences verbally to go with practical activities.
- Explore the concept of "is equal to" using games, objects and Numicon in balances and relate this to the = sign.
- Solve simple word problems using their fingers
- Use Numicon to explore pattern in addition and support visualisation of addition facts.
- Introduce symbols as ways to record their addition activities
- Children record addition sentences alongside their practical addition.

They begin with the format $2+3=5$ and then use $5=2+3$

They solve problems with missing numbers

$3 + 4 = \square$ $\square = 3 + 4$
 $3 + \square = 7$ $7 = \square + 4$ $7 = 3 + \square$

Understanding subtraction as 'taking away'

Use games, songs and practical activities to develop understanding of subtraction in a wide range of different contexts and develop the vocabulary of subtraction

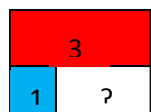
- Support children to make a record of subtraction activities in pictures, words or symbols.



- Construct number sentences verbally to go with practical activities
- Solve simple word problems using their fingers
- Use Numicon with subtraction covers to emphasise the relationship between addition and subtraction.
- Introduce symbols as ways to record their addition activities
- Children record addition sentences alongside their practical addition.

They begin with the format $5-3=2$ and then use $2=5-3$

- Solve problems with missing numbers.



Pupils should be taught to:

add and subtract numbers using concrete objects, pictorial representations, and mentally, including:

- a two-digit number and ones
- a two-digit number and tens
- two two-digit numbers
- adding three one-digit numbers
- show that addition of two numbers can be done in any order (commutative)
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

Pupils need to have a secure understanding of Place Value in order to calculate with 2 digit numbers. To secure this they should play simple base 10 games to build understanding of the values represented by digits and exchange between tens and ones.

Combine numbers using Dienes and 10ps and 1ps, vertically placed

Tens	Ones		
		Expanded version	Formal written method
		$30 + 1$	31
		$+ 10 + 2$	$+12$
		<hr/> $40 + 3 = 43$ <hr/>	<hr/> 43 <hr/>

- Column addition, without crossing tens TU + U , TU + T , then TU +TU
- Then Column addition crossing tens

At each stage

Begin with practical method, describe process verbally and represent as expanded version . When understanding is secure, represent as column addition.

Retain models alongside written representations, including Dienes, money and Numicon.

Solve problems with missing numbers

$23 + 4 = \square$ $\square = 23 + 14$
 $35 + \square = 87$ $71 = \square + 34$ $71 = 3 + \square$

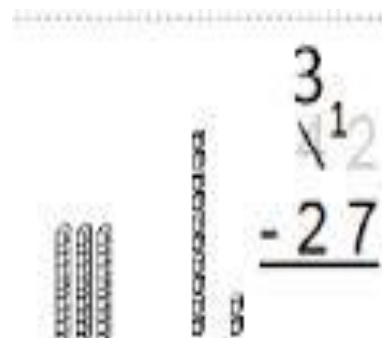
Subtract numbers using Dienes and 10ps and 1ps, vertically placed

- Column subtraction, without exchange TU + U , TU + T , then TU +TU

Expanded version	Formal written method
$45 - 22$	45
$45 = 40 \text{ and } 5$	-22
$-22 = 20 \text{ and } 2$	<hr/> 23 <hr/>
$20 \text{ and } 3 = 23$	

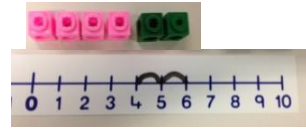
- Then Column subtraction with exchange

Expanded version
$42 - 27$
$42 = 30 \text{ and } 12$
$-27 = 20 \text{ and } 7$
$10 \text{ and } 5 = 15$



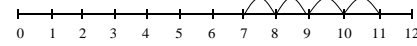
Understanding addition as increasing numbers and subtraction as decreasing numbers

- Find 'one more' and one less to twenty by counting or back on verbally
- Children begin to use floor and table number lines to support their own calculations counting on in ones within 20.

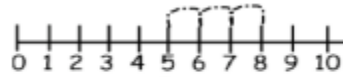


U+U, then TU + U.

7+ 4



8 - 3 = 5

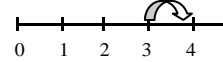
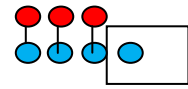


Bead strings or bead bars can be used to illustrate addition including bridging through ten. $8 + 5 = 13$.



Understand subtraction as difference

Use practical apparatus, drawings and number lines to solve problems by finding the difference between two numbers



Mental Recall of facts and Calculation strategies

Use practical apparatus and visual images to reinforce number facts and introduce specific calculation strategies. Children explore the strategies practically explaining how they are working out the calculation.

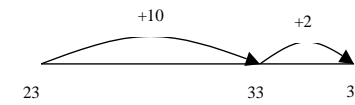
- Memorise and reason with number bonds of 4, 5, 6, 7, 8, 9 and 10 in several forms (for example, $2 + 7 = 9$; $9 - 7 = 2$; $2 = 19 - 7$).
- Derive and use bonds to 20.
- Count on and back in ones from a given 2-digit number
- Add three single-digit numbers identifying doubles or pairs to 10
- Add 10 to a single digit number; Subtract 10 from any given 2-digit number
- Use number facts to add single-digit numbers to two-digit numbers, e.g. use $4 + 3$ to work out $14 + 3$,
- Add by putting the larger number first
- Recognise doubles of numbers up to double 10.
- Use the commutative law: $5+4 = 4+5$
- Use number facts to subtract single-digit numbers from two-digit numbers, e.g. use $7 - 2$ to work out $17 - 2$,

Use a range of mental calculation strategies increasing or decreasing numbers

e.g.

- **Count on or back in tens and ones,**

$23 + 12 = 23 + 10 + 1 + 1$

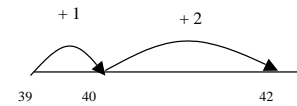


- **Partitioning and bridging through 10.**

$8 + 7 = 15$ $8 + 2 + 5 = 15$



- **Find a small difference by counting up**



Mental Recall of facts and Calculation strategies

Pupils use table number lines then draw empty number lines to support or explain their mental calculation strategies.

- Number bonds – know all the pairs of numbers which make all the numbers to 20,
- derive and use related addition facts to 100
- Count on in ones and tens from any given 2-digit number
- Add two or three single-digit numbers identifying doubles or pairs to 20
- Add a single-digit number to any 2-digit number using number facts, including bridging multiples of 10. (E.g. $45 + 4$, $38 + 7$)
- Add 10 and small multiples of 10 to any given 2-digit number
- Partition 2 digit numbers into tens and units in different ways e.g. $23 = 20+3$ or $13+10$. Pupils should partition numbers in different ways (for example, $23 = 20 + 3$ and $23 = 10 + 13$) to support subtraction