

ADDITION STRATEGIES

To demonstrate a depth of understanding of addition, children should be able to progress through and use a variety of strategies to solve problems and show working. Not be over reliant on one method.

Literacy, Numeracy, Health & Wellbeing

Combining 2 collections

Once children can count one group of objects they can begin to combine two sets.



4 yellow flowers plus 3 orange flowers is 7 flowers altogether.

Counting on -screened collections

Roll 2 dice. Allow children to see both sets of numbers, then cover the larger number up.



I rolled a 5 and 2. I have covered the 5.

5...6,7

This is a tricky concept! Children may initially drop back to counting from 1.

1,2,3,4,5 6,7

Children can progress to using larger numbers within their counting range. However when using this 'counting on' strategy, the second number should be no larger than 6. E.g $32 + 5 \dots 32 \dots 33, 34, 35, 36, 37$

Regroup to make 5/10

This is an essential skill. Using ten frames, start with the larger number and place that number of objects on the first ten frame. Now fill up that ten frame with the objects from the second set and then put the remaining objects on the next ten frame.

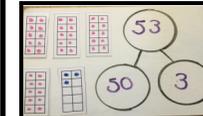


First I will fill in 6 white flowers on the ten frame. Then I will partition the 5 yellow flowers. I'll put 4 on to fill up the first ten frame. I still have 1 flower left so I will put that on the next ten frame. That makes 11 altogether!

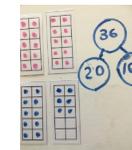
Part-Part whole

Being able to see sets in numbers.

I see $5+5$ is 10 and 8 is 18



I can split 53 into 50 and 3

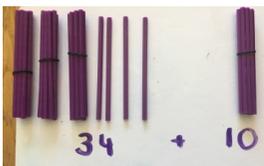


36 can be split into $20 + 16$

Adding 10s/100s to 2/3 digit numbers

Using sticks or straws bundled in groups of 10s/1s and add $10/20/30$ etc.

Progress to 100s/10s and 1s. $432 + 10/20/30$ etc



Partition numbers in different ways

For children to partition they need to have a good understanding of place value - 37 is $30 + 7$ or 3 tens + 7 ones

463 is $400 + 60 + 3$ or 4 Hundreds + 6 tens + 3 ones



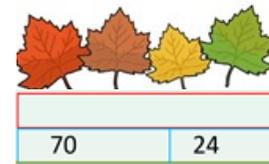
Children can then use this skill to add $364 + 235$

$\rightarrow 300 + 200 = 500$
 $60 + 30 = 90$
 $4 + 5 = 9$

Bar Model

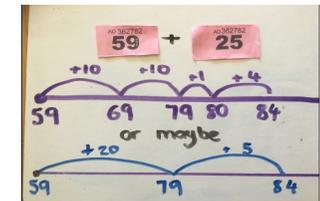
Bar models are a good method to help children solve word problems. They help children visualise what is happening.

If you count 70 leaves on a path and another 24 leaves fall to the ground, how many leaves would there be?



Empty Number Line

This method can be used to solve addition and subtraction calculations. It is also an excellent strategy for solving problems involving time and money.



Formal algorithm

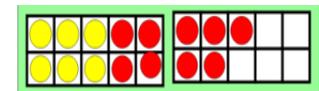
This should be the last strategy children learn for addition/subtraction. Even when they fully understand how and why to use it, children should continue to be given lots of opportunities to use some of the other methods mentioned in this leaflet. The algorithm requires less mental agility than other strategies and children can become over reliant on this method.

$$\begin{array}{r} 11 \\ 489 \\ + 916 \\ \hline 1405 \end{array}$$

Decimals

All of the above methods for adding with whole numbers can be applied in the same way for addition with decimals. For some tasks, the whole ten frame can represent 1 and therefore each box would be one tenth.

$6/10 + 9/10 = 1$ and $5/10$



SUBTRACTION STRATEGIES

To demonstrate a depth of understanding of subtraction children should be able to progress through and use a variety of strategies to solve problems and show working, Not be over reliant on one.

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Word sequences

Counting backwards in 1s/10s/100s from different starting points e.g., 23, 22, 21, 20 or 51, 41, 31, 21. Depending on the stage of the child.

Taking away using real objects

4 teddies in a shop. One gets sold. How many are left?

Subtracting 10/100 to 2/3 digit numbers

$44 - 10 = 34$
Cover the straws as you remove 10 and see if the child can visualise how many are left. Repeat for subtracting 20 etc.

Exchanging with concrete materials.

$32 - 17$. I can subtract a ten first,. That leaves 22. Now I will need to exchange one of the ten blocks for 10 ones so that I can subtract the remaining 7.

Counting back to subtract using screens

Children can count back within their number range. When using this count back in ones strategy, the second number should be no more than 6

$24 - 5$.
24.....23, 22, 21, 20, 19

3 teddies

"9 teddies came for a picnic. 3 of them hid in a box. Count back to find out how many are left?"

9....8, 7, 6

Empty Number Line

This method can be used to solve addition and subtraction calculations and it is also an excellent strategy for solving problems involving time and money.

$74 - 35$

Count up to subtract

When children understand that subtraction can mean 'The difference between' then this is can be an efficient method for solving subtraction problems.

Add up to subtract $83 - 74$

$74 \rightarrow 75 \rightarrow 80 \rightarrow 83$

$1 + 5 + 3 = 9$ The difference between 74 and 83 is 9.

Formal algorithm

This should be last strategy children learn for subtraction with whole numbers. Even when they fully understand how and why to use it, children should continue to be given lots of opportunities to use the other methods mentioned in this leaflet. The algorithm requires less mental agility than other strategies and children can become over reliant on this.

$$\begin{array}{r} 52 \\ - 17 \\ \hline 35 \end{array}$$

Comparing numbers

It is crucial for children to explore subtraction by comparing sets and finding the difference between numbers.

The difference between 9 and 6 is 3

Part-Part whole

Being able to see that a whole number is made up of different parts. Children begin to understand that subtraction is the inverse of addition. Dominoes are an excellent resource for this.

I see $5 + 3 = 8$ and $3 + 5 = 8$
So $8 - 3 = 5$ and $8 - 5 = 3$

Bar Model

Bar models are a good method to help children solve word problems.

There are 29 pupils in the class. 17 are boys. How many are girls?

Decimals

All of the above methods for subtraction with whole numbers can be applied in the same way for subtraction with decimals.

$£5.60 - £3.99 =$

$1p + £1 + 60p = £1.61$