Calculation in Addition

Tools to support
- Number lines
- Bead strings
- Arrow cards
- Objects/ counters
- Dienes/multilink
- ThHTU Place value cards

Key Vocabulary
Add, more, make, total, sum, altogether, double, one more , ten more, plus, regroup, exchange, hundreds, tens, ones

How many more to make…?

How many more is … than…?

Context
- Money
- Measures
- Decimals
- Percentages

Teaching points
To support children with formal addition we need to ensure they have mental calculation strategies in place;
- Children need to be confident counting on particularly across boundaries. Daily counting is advised.
- Number bonds up to 20 are an essential mental tool to save children from having to count on on their fingers.
- The numbers used in calculations need to be appropriate for the learner e.g. initially we would give numbers that don't cross boundaries before we begin exchanging tens.
- It is important that the language we use avoids misconceptions such as referring to 50+20 as 5 + 2. We need to reinforce that we are talking about 5 tens or 50 add 2 tens or 20 so that children understand the value of the numbers they are calculating.
- Estimate and check- Children need to routinely use these skills when calculating to ensure they consider the reasonableness of their answers. Checking could either be using the inverse operation or using an alternative method they are more confident with.

Errors/Misconceptions
- Incorrect counting strategies which are not identified because of a flawed understanding.
- Adding a 0 would still leave you with the original number (use physical objects to show this is the case)
- Confusion over adding or exchanging when 0 is a place holder (Use physical objects to support this).
- Crossing 10/100/1000 boundaries can be a difficult concept for some children and they will need further support and consolidation time.
- Carrying over 10's, 100's, 1000's will also need further consolidation (Using concrete apparatus here is essential).

End of year expectations
EOY3: Columnar to 3 digits
EOY4: Columnar to 4 digits Including uneven numbers of digits
EOY5: Columnar over 4 digits including uneven number of digits and decimals
EOY6: Larger numbers plus uneven number of decimals

Apparatus will be need with each of these methods when first introducing them.

Number Lines

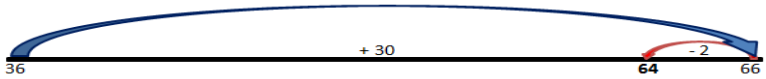
Unstructured number lines can help children to record the steps needed in a calculation.

28+36

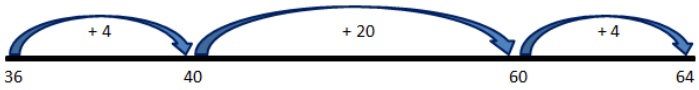
Sequencing

Add smallest onto largest then bridge through 10, 100, 1000

Compensation



Bridging



Partitioning

Partition smaller number to add to larger number.

38 + 20 + 6 = 64 Models??

Partitioning then recombine

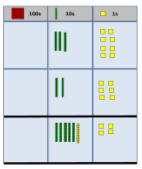
Using dienes alongside.

T U
3 8
+2 6

30 and 8
20 and 6
50 and 14

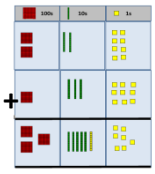
Expanded Column Addition

Children require written methods for those calculations they struggle to do in their heads. These build upon mental strategies. Place value is very important here where children use their knowledge of the value of the digits.



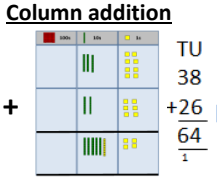
TU
38
+26
14 (8+6)
50 (30+20)
64

Children will add the least significant digits first. They do not need long on this as it is used for preparation for carrying.



H T U
2 2 8
+1 3 9
1 7 (8 + 9)
5 0 (20 + 30)
3 0 0 (200 + 100)
3 6 7

Column addition



TU
38
+26
64
1

HTU
2 3 8
+1 2 9
3 6 7
1

Eventually moving to larger numbers with even and uneven numbers of digits.

HTh	TTh	Th	H	T	U
3	7	6	2	5	3
+	1	9	3	1	8
3	9	5	5	7	1
	1			1	

Eventually moving to decimal numbers with even and uneven numbers of digits.

Th	H	T	U	.	t	h
4	3	6	2	.	2	
+	1	7	6	.	4	3
4	5	3	8	.	6	3
	1					

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