Addition

Year Group: Key Objectives	Written Strategies/Recording	Representations/Vocabulary
Year 1: ✓ Represent and use number bonds and related subtraction facts within 20 ✓ Add one-digit and two-digit numbers to 20, including zero ✓ Solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as 7 =__ - 9.	<u>Activities/recording</u> Practical Apparatus, coins, Numicon etc. Number lines e.g. 4 + 8 = +1 +1 +1 +1 8 9 10 11 12 For this number line the higher number is used as the starting point – this links with encouraging children to put the larger number in their head and count on from there.	Number line, Number track, 100 square, Deines apparatus, Numicon, Coins and notes, Practical apparatus e.g. counters, Number mobiles, Pictorial representations of problems, Dominoes Calculation, add, addition, together, altogether, total, more, more than, and, sum, count on, equals, is equal to, is the same as,
Year 2: ✓ Solve problems with addition: - Using concrete objects and pictorial representations, including those involving numbers, quantities and measures - Applying their increasing knowledge of mental and written methods ✓ Recall and use addition facts to 20 fluently, and derive and use related facts up to 100 ✓ Add 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	<u>Activities/recording</u> Practical apparatus, coins, Numicon etc. Number lines e.g. 13 + 16 = ***To do these types of calculations children need to be able to partition and recombine 2 digit numbers*** +10 +3 16 26 29 Children use number lines to add TU and TU e.g. 53 + 26 = +10 +10 +6 53 63 73 79	As above plus: Arrow Cards (TU), Column representations of Tens and Units, Models of written and mental strategies used for calculation, Numbers partitioned in different ways e.g. 23 = 20 +3 = 10 + 13, meanings of < > =, As above plus: tens, ones, change, columns, place value, boundary, partition, method, strategy, inverse, inverse operation, calculate

	This should lead to the more efficient	
	+20　　　　　　　　　　+6 _____ 53　　　　　　　　　73　　　79 As in Year 1, the higher number has been placed at the beginning of the number line. Children may also partition easy numbers and record them in an informal way e.g. 　　　　　　13 + 14 = 10 + 3 + 10 + 4 or　　　　　13 + 14 = 10 + 10 + 3 + 4	
Year 3: ✓ Add numbers with up to three digits, using formal written methods of columnar addition ✓ Add numbers mentally, including: 　- A three digit number and ones 　- A three digit number and tens 　- A three digit number and hundreds	<u>Recording</u> Once children are able to add two 2-digit numbers 'mentally' using the more efficient number line method then vertical addition, using partitioning, can be introduced in Year 3. This should be modelled using practical equipment (deines, Numicon) and visual representations Using partitioning to add TU and TU: 　　e.g. 13 + 14 =　　　　13 = 10 + 3 　　　　　　　　　　　　14 = <u>10 + 4</u> 　　　　　　　　　　　　　<u>20 + 7</u> = 27 　　e.g. 53 +26 = 53 = 50 + 3 　　　　　　　　26 = <u>20 + 6</u> 　　　　　　　　<u>70 + 9</u>　= 79 　　e.g. 324 + 237 =　　324 = 300 + 20 + 4 　　　　　　　　　　237 = <u>200 + 30 + 7</u> 　　　　　　　　　　　<u>500 + 50 + 11</u>= 61 This leads to more formal column addition e.g. 53 + 26 = 　　　　　　　　　　　　553 　　　　　　　　　　　+ <u>326</u> 　　　　　　　　　　　　　9 　　　　　　　　　　　　70 　　　　　　　　　　<u>800</u> 　　　　　　　　　　　879 **Children will always be taught to add from the right hand column first when using formal written strategies.**	As above plus: Arrow Cards (HTU), models of column addition strategies, Number lines marked in tenths, As above plus: Hundreds, tenths, decimal, decimal point, decimal place, Increase, decrease, plus, minus, adjust

Year 4: ✓ Add numbers with up to 4 digits using the formal written methods of columnar addition where appropriate	**Recording** Partitioning (for children who still need reinforcement of place value and who may still be very reliant on other resources e.g. arrow cards, deines etc.): e.g. 248 + 620 = $\quad$ 600 + 20 + 0 $\qquad\qquad\qquad\qquad\qquad$ 200 + 40 + 8 $\qquad\qquad\qquad\qquad\qquad$ 800 + 60 + 8 = 868 This will lead to more formal column addition, starting with the lowest value again $\qquad$ e.g. $\qquad\qquad\qquad$ 248 $\qquad\qquad\qquad\qquad\qquad$ + 620 $\qquad\qquad\qquad\qquad\qquad\qquad$ 8 $\qquad\qquad\qquad\qquad\qquad\quad$ 60 $\qquad\qquad\qquad\qquad\qquad$ 800 $\qquad\qquad\qquad\qquad\qquad$ 868 Throughout this progression, teachers may need to model two strategies side-by-side to demonstrate the links between them. **Compact method** If children are secure with the above methods, then they will move on to the most compact method of column addition. **Numbers are 'carried' to the right of the next column and between the total lines at the bottom of the calculation.** E.g. 358 + 135 $\qquad\quad$ 3 5 8 $\qquad\qquad\qquad$ 8 7 7 8 $\qquad\qquad\qquad\qquad$ + 1 3 5 $\qquad\qquad\qquad\quad$ 1 4 5 3 $\qquad\qquad\qquad\qquad\quad$ 4 9^1 3 $\qquad\qquad\qquad$ 1^1 0^1 2^1 3^1 1 Teachers should continue to use appropriate number names to support place value work e.g. '8 add 5', '50 add 30 add 10', '300 add 100'.	As above plus: Arrow Cards (ThHTU), models of column addition strategies, Number lines marked in hundredths As above plus: Thousands, hundredths, negative number, round
Year 5: ✓ Add whole numbers with more than four digits, including using formal written methods (columnar addition) ✓ Add numbers mentally with increasingly large numbers	**Recording** Children should continue to develop their fluency with numbers and efficiency of working. They should also look at examples containing decimals and different amounts of digits after the decimal points or where more than two numbers are added (including columns with totals greater than 19) They should be taught to ensure numbers are lined up by using decimal points and should be encouraged to put a 0 in as a place holder if they need to e.g. 19.7 + 6.76 $\qquad$ 1 9 . 7 0 $\qquad\qquad\qquad\qquad$ + $\quad$ 6 . 7 6 $\qquad\qquad\qquad\qquad\quad$ 1 6^1. 4 6	As above plus: Place value charts to Millions/thousandths, models of column addition strategies, Number lines marked in thousandths As above plus: Tens/hundreds of thousands, Millions

Year 6:	Recording	As above plus:

✓ Solve problems involving addition
✓ Perform mental calculations, including with mixed operations and large numbers
	Children should continue to use the compact method to undertake addition calculations. The examples below show the increased grading of difficulty and we aim for children in Year 6 to be able to add more than two numbers with different amounts of digits after the decimal point.
	
	1. No carrying
	        23 315
	+ 42 + 624
	
	2. Extra digit in answer
	       94 561
	+ 73 718
	
	3. Carrying units to tens
	       47 237
	+ 25 + 516
	
	4. Carrying tens to hundreds
	     371 293
	+ 485 + 541
	
	5. More than column having to have a digit carried
	     376 29.5
	+ 485 + 5.64
	
	6. More than two numbers to be added
	    352 237
	      76 1.48
	+ 178 + 51.6
		Place value charts up to Tens of millions, models of column addition strategies, pictorial representations of addition of decimals,
		
		As above plus:
		tens of millions