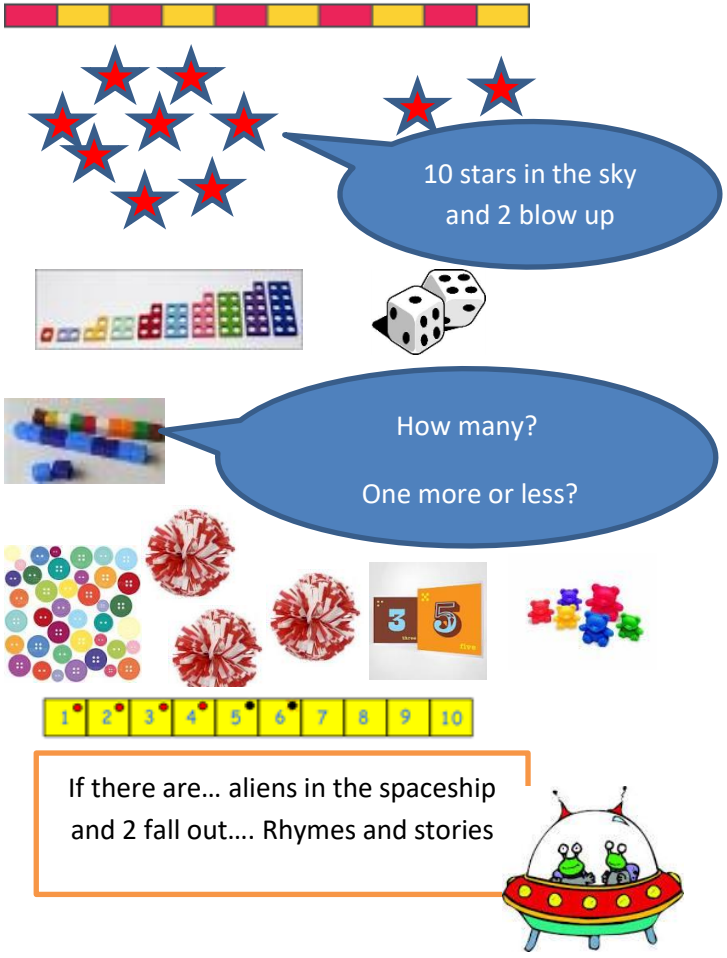
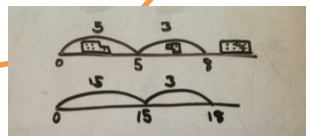
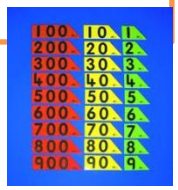
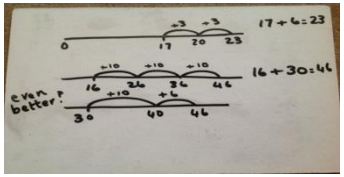
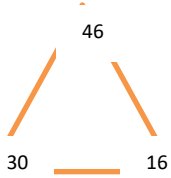
Progression in calculation Reception to Year 4
Number, Addition and Subtraction

Reception	Representations	Recordings
	Number Fun songs, counting forwards and backwards not always starting at one 	Children need opportunities to ***mark make*** in a variety of contexts – e.g. recording their score in a game, writing prices on labels for the shop... Provide a range of different sized papers and card, white boards, post-its, self-adhesive labels and clipboards etc. to encourage mark making. Ask questions like, 'Can you put something on paper to show me your score…?' 

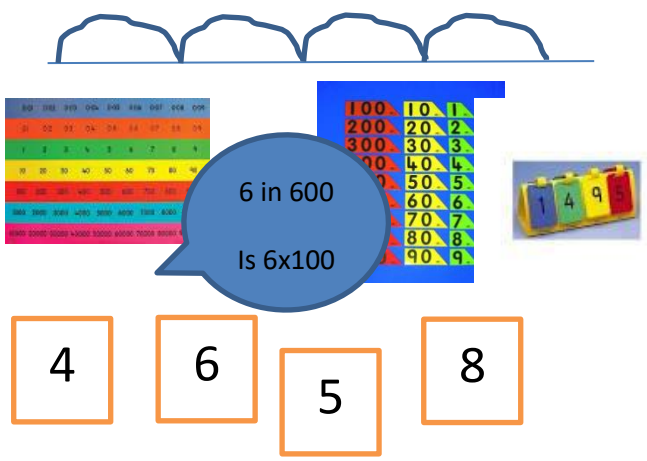
Key vocabulary addition:, more, add, plus, count on, makes, equals, total,
Key vocabulary subtraction: less, fewer, take away, count back, subtract, minus

Year 1	Representations	Recordings
Number • count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens • given a number, identify one more and one less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words. Addition and subtraction • 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 =? – 9.	 What number bead is this one? Bead strings to 20 and 100    Circle counting   5+3=8 15+3=18 What else do you know?   What about 5=8-3	Number sentences are used to explain problems alongside pictorial representations, photos of concrete objects along with photo story to illustrate language of number, comparison, calculations, operators. Step Counting in 2's, 5s, 10,s Explore commutativity to create number sentences. Explore number bonds within 10 and apply to within 20

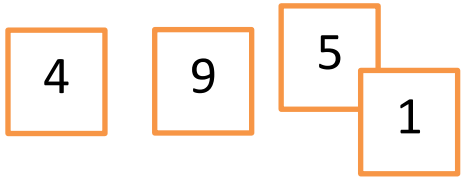
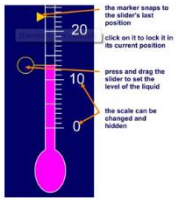
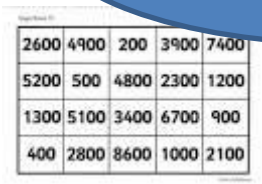
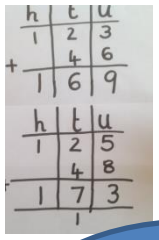
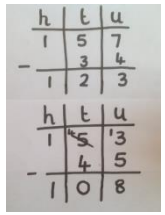
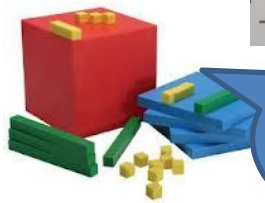
Key vocabulary: Addition - add, more, plus, and, make, altogether, total, equal, equals, double, most, count on, number line
Key vocabulary: Subtraction - equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is it_?

Year 2	Representations	Recordings
Number • count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward • recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems. Addition and subtraction • solve problems with addition and subtraction: • 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 and subtraction facts to 20 fluently, and derive and use related facts up to 100 • 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) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	   Numicon, number fans, place value cards to make 2 and 3 digit numbers   4 2 6 1  What number sentences can you make?     12+23 30+5 	36, 46,56,66 12,14,18,20 17,22,27,32 I have a pile of potatoes- what is the best way to count them? 46=40+6 46=30+16 26<42<61 I have 23p-4p what is the best resource to help me? 7+6- would numicon help me to picture the answer or bead string or number line? What about 17+6 16+30-what is the best resource to help me? Does it matter which number I start with? 46-30- the best resource, does it matter which number I start with? 12+23=35, 10+20+2+3=30+5 Demonstrate on a bead string, number line, numicon, jotting 20+8= 14+? What could I use to help me?

Key vocabulary: Addition – add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary
Key vocabulary: Subtraction – equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units

Year 3	Representations	Recordings
Number • count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number • recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas. Addition and subtraction • add and subtract numbers mentally, including: ▪ a three-digit number and ones ▪ a three-digit number and tens ▪ a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	  Explore relationships between add/subtract and larger numbers  Use of place value mats to add/subtract then link with formal recordings	4,8,12,16,18,24,18,16,12,8,4 8,16,24 noticing patterns, investigating other patterns 50, 100, 150 & 25,75,125,175, Play counting orchestra If I had 36 how many more 10's would I need to make 106? What is 40 less than 3851? What is the largest number I can make out of these digit cards? Can I make 2 numbers with a difference of 30? Can I make a number which would round to 4700 Children need to be able to cross boundaries using partitioning and/or number facts eg 15-7 to know 115-7 or 150-70 They need to explore the use of inverse to understand subtraction 346= 300 + ? + 6 They need to develop partitioning numbers into teens numbers **136 is 100+30+6- key step** **or 120+16** for 136- 28 (20 + 8) ***Introduce recording in columns when children have a full understanding of place value and can demonstrate knowing number bonds within 20***

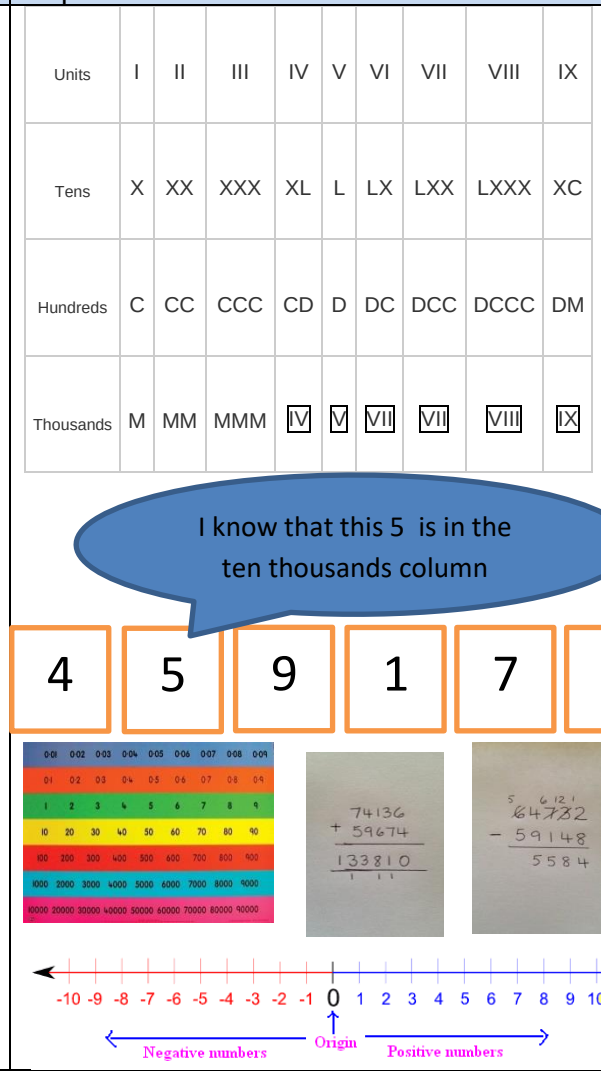
Key vocabulary: Addition – add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact
Key vocabulary: Subtraction – equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how may left, how much less is_? difference, count on , strategy, partition, tens, units exchange, decrease, hundreds, value, digit

Year 4	Representations	Recordings
Number • count in multiples of 6, 7, 9, 25 and 1000 • find 1000 more or less than a given number • count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) • order and compare numbers beyond 1000 • identify, represent and estimate numbers using different representations • round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value. Addition and subtraction • add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	     Can you make a numbers that will round to 5000 Which is the closest?     Children need to see the size of numbers	Becoming increasingly sophisticated- reference resource Negative number counting- see number lines in different context Thermometer ITP Imagine a world without zero Link with measure- round numbers for a variety of purposes In calculations- estimate answers that will round to 700 496 +158? How do you know, what other examples can you think of? ***Develop use of formal methods*** ***123 to 125*** *where carrying is used* ***+46 +48*** ***157 to 153*** *where exchange is used* ***-34 -45*** ***Discuss approaches with children. Ensure an understanding of the size of the answer to check. Demonstrate when to use exchange, why and how – when principles are understood move onto larger numbers. Choose numbers for calculation carefully***

Key vocabulary: Addition – add, more, plus, and, make, altogether, total, equal to , equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact
Key vocabulary: Subtraction – equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse

Progression in calculation Reception to Year 4
Number, Addition and Subtraction

Key vocabulary: Addition – add, more, plus, and, make, altogether, total, equal to , equals, double, most, count on, number line, sum, tens, units, partition, plus, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact

Year 5	Representations	Recordings
Number • Read, write, order and compare numbers to at least • 1 000 000 and determine the value of each digit • Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • Round any number up to 1,000,000 to the nearest 10, 100, 1000, 10 000, and 100 000 • Solve number problems and practical problems that involve all of the above • Read Roman numerals to 1000 (M) and recognise years written in Roman numerals Addition and subtraction • add and subtract whole numbers with more than 4 digits using formal written methods of columnar addition and subtraction • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why		It is important that the children understand the place value of different digits. Problem solving eg: There were 85 356 people at the Liverpool match. There were 40 000 fewer people at the Manchester United match. How many people were at the Man U match? Nrich activity: *the thousands game* What is 12 462 minus 2300? Can you explain how you found the answer? ***Continue to develop use of formal methods*** ***Choose numbers for calculation carefully.*** ***Problem Solving involving multi-step problems e.g:*** 13 502 people were at the match last week and there are 2483 more this week, how many more people need to attend to bring the total to the club's target of 20 000 people?

Key vocabulary: Subtraction – equal to, take, take away, less, minus, subtract, leaves, distance between, how many more, how many fewer/less than, most, least, count back, how many left, how much less is_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse