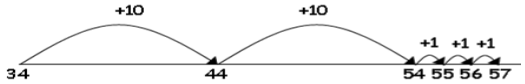
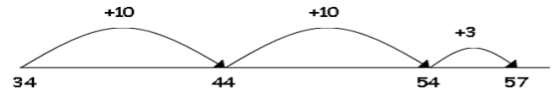
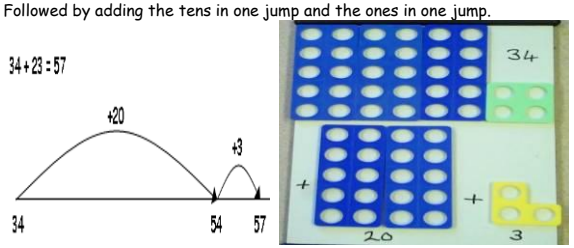
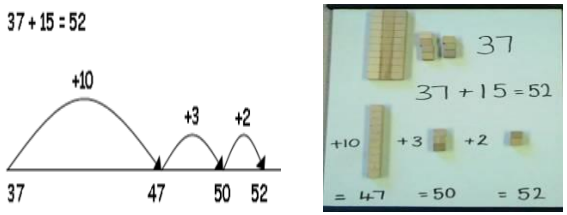
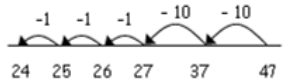
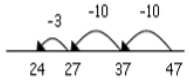
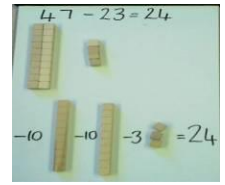
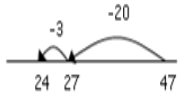
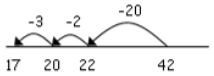
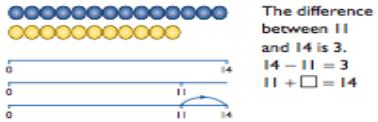
In order to encourage children to work mentally, calculations should always be presented horizontally so children can make decisions about how to tackle them.

	National Curriculum	Guidance	Addition To be taught alongside each other Subtraction	Vocabulary
Y2	Pupils will be taught to: solve simple one-step 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 missing number problems.	Pupils will extend their understanding of the language of addition and subtraction to include sum and difference. Pupils will practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10, 10 - 7 = 3 and 7 = 10 - 3 to calculate 30 + 70 = 100, 100 - 70 = 30 and 70 = 100 - 30. They will check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (e.g. 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). Recording addition and subtraction in columns supports place value and prepares for efficient written methods with larger numbers	Children should use number lines that are marked out in jumps of one and ten and learn which would be most appropriate for a given calculation. Children will begin to use 'empty number lines' themselves starting with the larger number and counting on, keeping the first number whole. Numicon and Base Ten should be used to support this. It is important that the visual image of these resources is related to the number line. Encourage children to use the language of **partitioning and bridging** when explaining their strategies. **Counting on.** First counting on in tens and ones.' (jumping in 10's) 34 + 23 = 57  Then helping children to become more efficient by adding the ones in one jump (by using the known fact 4 + 3 = 7). 34 + 23 = 57  Followed by adding the tens in one jump and the ones in one jump.  Bridging through ten can help children become more efficient. (target 10)  **Compensation** Children should be taught when adding 9, it is easier to add 10 then subtract 1, modelling on a bead bar over jumping 10 **37 + 9 =?? → 37 + 10 = 47 → 47 -1 = 46** **Complementary addition.** Children should understand solving word problems, such as 'You need 10 marbles, but you only have 6, how many more do you need?' Model on bead bar and number line… 'How to find the missing number' e.g. 10 = 6 + __	Children will use bead strings and numbered number lines to support calculations. They should begin to use empty number lines. When subtracting, children should be taught to only partition the second number. **Counting back:** First counting back in tens and ones. 47 – 23 = 24  Then helping children to become more efficient by subtracting the units in one jump (by using the known fact 7 – 3 = 4). 47 – 23 = 24   **Followed by** subtracting the tens in one jump and the units in one jump. 47 – 23 = 24  Bridging through ten can help children become more efficient. 42 – 25 = 17  **Counting on:** It is important that children experience finding the difference between 2 numbers by counting on. The difference ITP is a good visual image.  It is important that this is modelled using two bead strings, or two Numicon plates as shown in the picture above. Children should experience finding the difference in a range of contexts including height e.g. growth of two seedlings. **Compensation** When subtracting 9, it is easier to subtract 10 then add 1, (model on a bead bar) **37 - 9 =?? → 37 - 10 = 27 → 27 + 1 = 28**	+, add, addition, more, plus make, sum, total altogether score double, near double one more, two more… ten more… one hundred more how many more to make…? how many more is… than…? how much more is…? -, subtract, subtraction, take (away), minus leave, how many are left/left over? one less, two less… ten less… one hundred less how many fewer is… than…? how much less is…? difference between half, halve =, equals, sign, is the same as tens boundary

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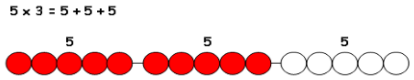
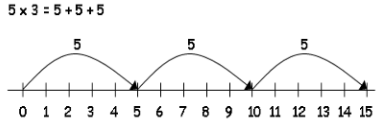
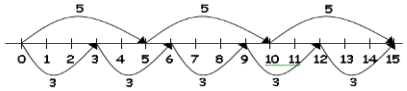
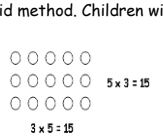
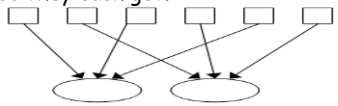
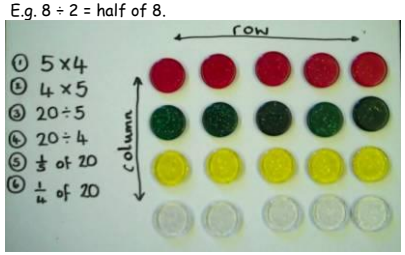
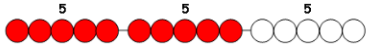
	National Curriculum	Guidance	Multiplication To be taught alongside each other Division	Vocabulary
Y2	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts. Write simple fractions for example, 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2 .	Pupils should use a variety of language to describe multiplication and division. They are taught multiplication and division with larger numbers through equal grouping and sharing out quantities, relating multiplication tables to arrays and repeated addition and finding more complex fractions of objects, numbers and quantities. Pupils should be introduced to the multiplication tables. They should practise to become fluent in the 2, 5 and 10 multiplication tables and connect them to each other. They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. Pupils should work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, relating these to fractions and measures (e.g. 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (e.g. 4 × 5 = 20 and 20 ÷ 5 = 4).	Children will develop their understanding of multiplication and use jottings to support calculation:  **Repeated addition** 5 times 3 = 5 x3 = 5 three times = Three groups of 5 = 5 + 5 + 5 = 15 On a bead bar:  And on a number line:  Children should know that 3 x 5 has the same answer as 5 x 3. This can also be shown on the number line. 15 = 5 x 3  15 = 3 x 5 **Arrays** Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method. Children will need to be taught the language of 'rows'   5x2 = 10 2x5 = 10 and 'columns'. The **multiplication ITP is a good visual image**. They should explore arrays in the environment. It is important to connect the array model to repeated addition using resources such as counters and show the link between more complex fractions of objects, numbers and quantities. **Scaling** Exploring concepts such as: 'This is twice as long as/ half as long as/ 3 times as tall as.' 	Children will develop their understanding of division and use jottings to support calculation. They should make the link between counting in equal steps and grouping. **Sharing** '6 sweets shared between 2 people, how many do they each get?'  Relate fractions to the sharing aspect of division through arrays and model the recording. E.g. 8 ÷ 2 = half of 8.  **Grouping** 'There are 6 sweets, how many people can have 2 sweets each?'  'Crisps come in packs of 5, I have 20 children and each needs a packet. How many packs do I need to buy?' 20 ÷ 5 = 4  5 5 5 5 **Repeated Subtraction** 15 ÷ 5 = 15 - 5 - 5 - 5 = (3 groups of 5)  Children should be encouraged to use their known multiplication facts to work out division calculations. The **bead bar** will help children with interpreting calculations like 12 ÷ 3 = as 'How many 3's equal 12? Solve calculations using symbols to stand for unknown numbers and complete equations using **inverse** operations. □ ÷ 2 = 4 20 ÷ △ = 4 □ ÷ △ = 4 **Scaling** Sam ran 6km on Saturday. On Sunday he ran half as far. How far did he run on Sunday?	lots of, groups of □, times, multiply, multiplied by multiple of once, twice, three times… ten times… times as (big, long, wide… and so on) repeated addition array row, column double, halve share, share equally one each, two each, three each… group in pairs, threes… tens equal groups of □, divide, divided by, divided into left, left over Equipment: Numicon Counters Beadstrings Cubes Numberlines Number tracks Number tiles Coat hangers & pegs Practical Counting equipment Dishes/hoops Socks/Gloves ITP's Cuisenaire rods