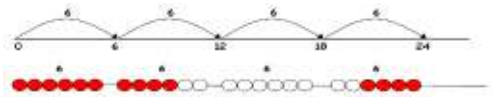
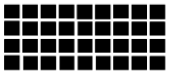
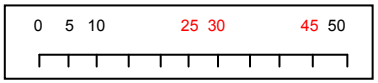
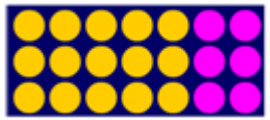
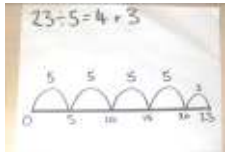
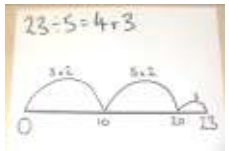
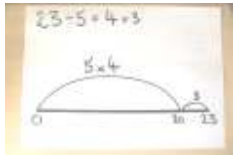
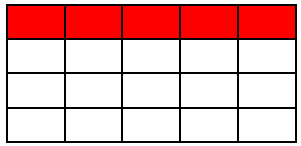
In order to encourage children to work mentally, calculations should always be presented horizontally so children can make decisions about how to tackle them.
Encourage children to choose to use the most efficient method for the numbers and the context. Teach operations together to emphasise the importance of inverse.

	National Curriculum	Guidance	Multiplication To be taught alongside each other	Division	Vocabulary
Y3	**P**upils should be taught to: Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to efficient (including formal) written methods Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	Pupils should continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. Through doubling, they connect the 2, 4 and 8 multiplication tables. Pupils should develop efficient mental methods, for example, using commutativity (e.g. 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) and multiplication and division facts (e.g. using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3). Pupils should develop reliable written methods for multiplication and division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the efficient written methods of short multiplication and division. Pupils should solve simple problems in contexts, deciding which of the four operations to use and why, including measuring and scaling contexts, and correspondence problems in which m objects are connected to n objects (e.g. 3 hats and 4 coats, how many different outfits; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).	Children will continue to use: **Repeated addition** 6 multiplied by 4 = 6 x 4 = 6 'four times' 4 times 6 is 6 + 6 + 6 + 6 = 24 or 4 lots of 6 Children should use number lines or bead bars to support.  **Arrays** Increasingly use arrays to make links between x and ÷. Children should model a multiplication calculation using an array. This knowledge will support the development of the grid method.  9 × 4 = 36 4 × 9 = 36 36÷ 9 = 4 36 ÷ 4 = 9 Important for teachers to be consistent. Either seen as a row of 9, 4 times (9 x 4)… or a column of 4, 9 times (4 x 9). Both are correct Moving towards 2 digit x 1 digit using place value. 90 x 4 = 40 x 9 = 360 360 ÷ 9 = 40 360 ÷ 4 = 90 **Derive facts from unknown facts** Use number line to show known multiplication facts and then derive unknown facts. E.g. if you know 5 x 10 = 50. Count back 5 to derive 5 x 9 etc. 5 x 5 will be half of 5 x 10 etc… Relate to other 'tables'.  Also **Partition** an array to show how to derive an unknown fact from a known fact e.g. use knowledge of 2 and 5 times tables to work out multiples of 7, e.g. 7 x 3 = 5 x 3 + 2 x 3 15 + 6 = 21  **Scaling** Use Base 10 equipment to show 10 times bigger / smaller. Model the enlargement. E.g to show why 6 x 3 helps in solving 60 x3. *Find a ribbon that is 4 times as long as the blue ribbon r = b x 4* **Using symbols to stand for unknown numbers to complete equations using inverse operations** ☐ x 5 = 20 3 x △ = 18 ☐ x O = 32 **Partitioning (**2 digit x 1 digit numbers) 38 x 5 = (30 x 5) + (8 x 5) = 150 + 40 = 190	Ensure that the emphasis in Y3 is on **grouping** rather than sharing, except when using fractions as this is sharing. Children will continue to use: **Number lines and known multiplication facts to solve division following on from repeated addition.** Use number lines and known multiplications to solve divisions incl. with **remainders.** Move into **chunking** (**grouping**) using these steps. Encourage children to be as efficient as possible. 23 ÷ 5 = 4 r3  **GROUPING:** 23 children are asked to get into groups of 5. How many groups do they make? **SHARING:** 23 marbles are shared between 5 people. How many marbles do they each get? Moving towards more efficient approaches, using known facts.   **Using symbols to stand for unknown numbers to complete equations using inverse operations (**2 digit ÷ 1 digit numbers) 26 ÷ 2 = ☐ 24 ÷ △ = 12 ☐ ÷ 10 = 8 **Find unit fractions of numbers and quantities** Start to relate fractions to division in context: E.g. A cake recipe for 8 people uses 500g of flour. How much flour would I need to make a cake for 4 people? What is ½ ⅓ ¼ ⅛ of 12 litres or ¼ of 20 kg ? 	lots of, groups of ×, times, multiply, multiplication, multiplied by multiple of, product 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, division, divided by, divided into left, left over, remainder

Encourage children to check results by using the inverse, using a different method e.g. equivalent calculation and by estimation where appropriate.

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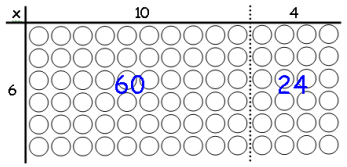
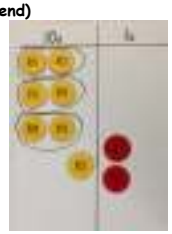
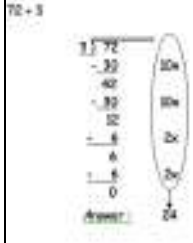
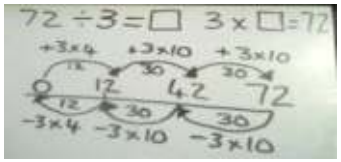
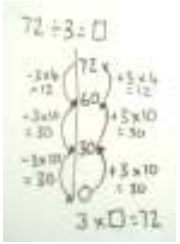
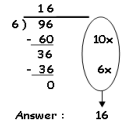
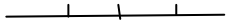
	National Curriculum	Guidance	Multiplication To be taught alongside each other	Division	Vocabulary
Y4	Pupils should be taught to: Recall multiplication and division facts for multiplication tables up to 12 × 12 Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations Multiply two-digit and three-digit numbers by a one-digit number using formal written layout Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects Solve simple measure and money problems involving fractions and decimals to two decimal places.	Pupils should continue to practise recalling and using multiplication tables and related division facts to aid fluency. Pupils should practise mental methods and extend this to three-digit numbers to derive facts, for example 200 × 3 = 600 into 600 ÷ 3 = 200, to become fluent. Pupils should practise to become fluent in the efficient written method of short multiplication for multiplying using multi-digit numbers, and short division with exact answers when dividing by a one-digit number. Pupils should write statements about the equality of expressions (e.g. use the distributive law 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). Pupils should solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as three cakes shared equally between 10 children.	2 and 3 digit x 1 digit numbers. Include X 0 and X 1 **(Continue setting calculations in a range of contexts-see above)** **Partitioning using place value and the distributive law** (continuing from Y3) 38 x 5 = (30 x 5) + (8 x 5) = 150 + 40 = 190 Children will continue to use arrays where appropriate leading into the grid method of multiplication.  (10 x 6) + (4 x 6) 60 + 24 **84** **Grid method** (Short multiplication – multiplication by a single digit) 23 x 8 Children will approximate first 23 x 8 is approximately 25 x 8 = 200, encouraging to use known facts to 100 e.g. 25 x 4 =100 23 X 8 24 (3 x 8) (record in expanded format first) + 160 (20 x 8) 184 **Recognise and use factor pairs.** **21 x 8 = 7 x 3 x 2 x 4 = 168** **Encourage children to multiply 3 single digits together** e.g. 3 x 4 x 5 and link to contexts such as volume. e.g. using 3 dice is it always, sometimes, never true that if you multiply all 3 dice numbers together you get the biggest total? 	2 and 3 digit ÷ 1 digit numbers. Include ÷ 0 and ÷ 1 **(Continue setting calculations in a range of contexts)** **Number lines and known multiplication facts to solve division** Children will continue to develop their use of number lines and known multiplication facts to solve division (using known multiples of the divisor). Initially, these should be multiples of 10s, 5s, 2s and 1s – numbers with which the children are more familiar. **Short division (2 digit ÷ 1 digit numbers)** **Illustrate using horizontal and vertical bead bar and number line to make link between vertical column method and chunking using knowledge of multiples of the divisor. (if a child struggles subtracting, just encourage to count forwards from zero in multiples of the divisor to reach the dividend)** 72 ÷ 3 = 24 Using place value counters (or base 10), children can group to solve problems.     96 ÷ 6  **Continue relating division to fractions and scaling** A pair of jeans originally cost £60. In a sale they were reduced by a quarter. How much do they cost now?  £60 Begin to model divisions as fractions and use knowledge of factors to simplify divisions by representing as equivalent ratios **E.G. £360 lottery win shared between 6 friends. Each gets a sixth. This is the same as £120 being shared between 2.** £360÷ 6= £120÷2 **NB Children need to make sensible decisions about rounding up or down after division problems accordingly. Any remainders should be shown as integers, e.g. 44 ÷ 12 = 3 r 8 but in context, e.g. 'How many dozen boxes of eggs will I need for 44 eggs?' 4**	lots of, groups of times, multiply, multiplication, multiplied by multiple of, product 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, division, divided by, divided into remainder factor, quotient, divisible by inverse

Encourage children to check results by using the inverse, using a different method e.g. equivalent calculation and by estimation where appropriate.

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