ADDITION

	Statutory expectations	Rapid recall /mental calculations	Non-statutory guidance
YR	Count … from 1-20 … and say which no. is 1 more than a given no. Using quantities objects, + two U nos and count on to find the answer. [Expected] Estimate no. of objects; check quantities by counting up to 20. [Exceeding]		
Y1	Add (and subtract) one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero Read/write/interpret statements involving addition (+), subtraction (-) and equals (=) signs.	Represent/use number bonds (and related subtraction facts) within 20. Missing number problems (e.g. 16 = ? + 9)	*Memorise/reason with bonds to 10/20 in several forms (eg 9 + 7 = 16; 16 - 7 = 9; 7 = 16 - 9). Pupils should realise the effect of adding or subtracting zero - establishes +/- as related operations.* *Pupils combine and increase numbers, counting forwards and backwards.*
Y2	**TU + U** **TU + tens** **TU + TU** **U + U + U** [Show addition of two numbers can be done in any order.]	Recall and use addition facts to 20 fluently. Derive and use related facts up to 100. Solve problems by applying increasing knowledge of mental methods.	*Pupils extend understanding of the language of + to include **sum**.* *Practise + to 20 to derive facts such as using 3 + 7 = 10 to calculate 30 + 70 = 100, 100 - 70 = 30 and 70 = 100 - 30. Check calcs, including by adding numbers in a different order to check +.* *Establishes commutativity and associativity of addition.*
Y3	Use **formal** written methods of **columnar addition**. **TU + TU** **HTU + TU** **HTU + HTU**	HTU + U; HTU + tens HTU + hundreds Use number facts and place value to solve problems. *For mental calcs with TU nos, answers could be >100.*	
Y4	Use **formal** written methods of **columnar addition**. **HTU + HTU** **ThHTU + HTU** **ThHTU + ThHTU**	*Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency.*	*Pupils build on their understanding of place value and decimal notation to record metric measures, including money.*
Y5	Add whole numbers >4 digits, including using **formal** written methods (**columnar addition**). Decimals up to 2dp (eg 72.5 + 45.7)	Add numbers mentally with increasingly large numbers (eg 12462 + 2300 = 14762). *Pupils mentally add tenths, and one-digit whole numbers and tenths.*	*They extend their knowledge of fractions to thousandths and connect to decimals and measures.* *Pupils should go beyond the measurement and money models of decimals (eg by solving puzzles.*
Y6	Solve multi-step problems in contexts, deciding which operations/methods to use and why. Decimals up to 3dp (Context: Measures)	Perform mental calculations, including with mixed operations and large numbers. *Using the number line, pupils add positive and negative integers for measures such as temperature.*	*Pupils develop skills of rounding/estimating to predict/check order of magnitude of ans to decimal calcs. Includes rounding answers to a degree of accuracy & checking reasonableness.*

	Count … from 1-20 … and say which no. is 1 less than a given no. Using quantities objects, subtract two U nos and count back to find the answer. [Expected] Estimate no. of objects; check quantities by counting up to 20. [Exceeding]		
	Statutory expectations	Rapid recall /mental calculations	*Non-statutory guidance*
Y1	Subtract (and add) one-digit and two-digit numbers to 20 (9 + 9, 18 - 9), including zero Read/write/interpret statements involving addition (+), subtraction (-) and equals (=) signs	Represent/use number bonds and related subtraction facts within 20. *Problems should include terms: put together, add, altogether, total, take away, distance between, more than and less than, so pupils develop concept of +/- and use operations flexibly.* Missing number problems (e.g. 7 = ? – 9)	*Memorise/reason with bonds to 10/20 in several forms (eg 9 + 7 = 16; 16 - 7 = 9; 7 = 16 - 9). Pupils should realise the effect of adding or subtracting zero - establishes +/- as related operations.* *Pupils combine and increase numbers, counting forwards and backwards.*
Y2	**TU - U** **TU - tens** **TU - TU** [Show subtraction of two numbers <u>cannot</u> be done in any order.]	Recall and use subtraction facts to 20 fluently. Derive and use related facts up to 100. Solve problems by applying increasing knowledge of mental methods.	*Pupils extend understanding of the language of subtraction to include **difference**.* *Practise subtraction to 20 to derive 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. Check calculations, including by adding to check subtraction.*
Y3	Use **formal** written methods of **columnar addition** **TU - TU** **HTU - TU** **HTU - HTU**	HTU - U HTU - tens HTU – hundreds Use number facts and place value to solve problems.	
Y4	Use **formal** written methods of **columnar subtraction**. **HTU - HTU** **ThHTU - TU** **ThHTU - HTU** **ThHTU - ThHTU**	*Pupils continue to practise both mental methods and columnar addition and subtraction with increasingly large numbers to aid fluency.*	*Pupils build on their understanding of place value and decimal notation to record metric measures, including money.*
Y5	Subtract whole numbers >4 digits, including using **formal** methods (**columnar subtraction**). Decimals up to 2dp (eg 72.5 - 45.7)	Subtract numbers mentally with increasingly large numbers (eg 12462 - 2300 = 10162). *Pupils mentally subtract tenths, and one-digit whole numbers and tenths.*	*They extend their knowledge of fractions to thousandths and connect to decimals and measures. Pupils should go beyond the measurement and money models of decimals (eg by solving puzzles.*
Y6	Solve multi-step problems in contexts, deciding which operations/methods to use and why. Decimals up to 3dp (Context: Measures)	Perform mental calcs, incl. with mixed operations and large numbers. *Using the no. line, pupils subtract positive/negative integers for measures such as temperature.*	*Pupils develop skills of rounding/estimating to predict/check order of magnitude of ans to decimal calcs. Includes rounding ans to a degree of accuracy & checking reasonableness.*

MULTIPLICATION

s	Children … solve problems, including doubling, halving and sharing. [Expected] Solve practical problems that involve combining groups of 2/5/10. [Exceeding]		
	Statutory expectations	Rapid recall /mental calculations	*Non-statutory guidance*
Y1	Solve one-step problems using concrete objects, pictorial representations and arrays *(with the support of the teacher)*		*Doubling numbers/quantities* *Count on/back in 2s, 5s and 10s*
Y2	Calculate statements for multiplication within the multiplication tables and write them using the multiplication and equals signs. [Show multiplication of two numbers can be done in any order.]	Recall and use multiplication facts for the 2, 5 and 10 multiplication tables, (including recognising odd and even numbers). *Use commutativity/inverse relations to develop multiplicative reasoning (eg 4 x 5 = 20 and 20 ÷ 5 = 4).*	*Pupils … practise to become fluent in the 2/5/10 multiplication tables and connect them to each other.* *They connect the 10x table to place value, and the 5x table to divisions on the clock face.* *They begin to use other multiplication tables and recall facts, including using related division facts to perform written and mental calculations.*
Y3	Write/calculate statements using the multiplication tables that they know. (progressing to **formal** written methods). **TU x U** (multiplier is 2/3/4/5/8/10)	Recall and use multiplication facts for the 3, 4 and 8 multiplication tables.	*Through doubling, they connect the 2/4/8 multiplication tables.* *Pupils develop efficient mental methods, using commutativity (eg 4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 = 240) and multiplication and division facts (eg using 3 x 2 = 6, 6 ÷ 3 = 2 & 2 = 6 ÷ 3) to derive related facts (30 x 2 = 60, 60 ÷ 3 = 20 & 20 = 60 ÷ 3).*
Y4	Use **formal** written layout: **TU x U** **HTU x U** Convert between different units of measure [eg km to m; hr to mi]	Recall multiplication facts to 12 x 12. Use place value, known & derived facts to multiply mentally, including x by 0/1; x 3 numbers. Recognise/use factor pairs and commutativity in mental calculations. *Pupils use multiplication to convert from larger to smaller units.*	*Practise mental methods and extend this to HTU numbers to derive facts, for example 200 x 3 = 600 into 600 ÷ 3 = 200.* *Write statements about equality of expressions [eg 39 x 7 = 30 x 7 + 9 x 7 and (2 x 3) x 4 = 2 x (3 x 4)]. Combine knowledge of facts and arithmetic rules to solve mental/written calculations (eg 2 x 6 x 5 = 10 x 6 = 60).*
Y5	Use a **formal** written method (including long x for TU nos) **TU x TU** **HTU x U / HTU x TU** **ThHTU x U** Convert between units of measure (eg km/m; m/cm; cm/mm; kg/g; litre and ml)	Identify multiples/factors, including finding all factor pairs of a number, & common factors of two numbers. Know/use vocabulary of prime numbers, prime factors and composite (non-prime) nos. Establish if a number up to 100 is prime; recall prime numbers to 19. x nos mentally using known facts. Multiply whole numbers and those involving decimals by 10/100/1000.	Pupils … *apply all the x tables frequently, commit them to memory and use them to make larger calculations.* *They understand the terms factor, multiple/prime, square/cube numbers & use to construct equiv. statements (eg 4 x 35 = 2 x 2 x 35; 3 x 270 = 3 x 3 x 9 x 10 = 9² x 10).*
Y6	Multi-digit numbers (up to 4 digits) x TU whole number using the **formal** method of **long multiplication**. Multiply one-digit numbers with up to two decimal places by whole numbers	Perform mental calculations, including with mixed operations/large numbers. Identify common factors/multiples and prime numbers. Use knowledge of order of operations to carry out calculations. Use estimation to check answers to calculations and determine an appropriate degree of accuracy. Identify value of each digit to 3dp and x nos by 10/100/1000 (ans to 3dp)	*Undertake mental calcs with increasingly large numbers and more complex calculations.* *Continue to use all x tables to calculate statements in order to maintain their fluency.* *Explore the order of operations using brackets.* *Common factors can be related to finding equivalent fractions.*

DIVISION

	Statutory expectations	Rapid recall /mental calculations	Non-statutory guidance
YR	Children … solve problems, including doubling, halving and sharing. [Expected] They solve practical problems that involve sharing into equal groups. [Exceeding]		
Y1	Solve one-step problems using concrete objects, pictorial representations and arrays *(with the support of the teacher)*	Recognise/find/name ½ as one of two equal parts of an object, shape or quantity. Recognise/find/name ¼ as one of four equal parts of an object, shape or quantity.	*Find simple fractions of objects, numbers and quantities* *Count on/back in 2s, 5s and 10s*
Y2	Calculate statements within the multiplication tables and write them using the division and equals signs. [Show division of two numbers <u>cannot</u> be done in any order.] Find ⅓, ¼, ⅔, ¾ of a length/objects/quantity. Write simple fractions eg ½ of 6 = 3	Recall & use division facts for the 2, 5 and 10 multiplication tables, Recognise/find/name/write fractions ⅓, ¼, ⅔, ¾ of a (length, shape), set of objects or quantity. Write simple fractions eg ½ of 6 = 3 and recognise equivalence of two quarters and one half. *Use commutativity/inverse relations to develop multiplicative reasoning* *(eg 4 x 5 = 20 and 20 ÷ 5 = 4).*	*Begin to use other multiplication tables/recall facts, including related division facts to perform written/mental calculations. Work with materials/contexts where division relate to grouping/sharing quantities. They begin to relate these to fractions/measures (eg 40 ÷ 2 = 20, 20 is a half of 40). They connect unit fractions to equal sharing and grouping, to numbers and to measures*
Y3	Write/calculate statements using the tables that they know (progressing to **formal** written methods). **TU ÷ U** (divisor is 2/3/4/5/8/10)	Recall and use division facts for the 3, 4 and 8 multiplication tables.	*Pupils develop efficient mental methods, using commutativity (eg 4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 = 240) and multiplication and division facts (eg using 3 x 2 = 6, 6 ÷ 3 = 2 & 2 = 6 ÷ 3) to derive related facts (30 x 2 = 60, 60 ÷ 3 = 20 & 20 = 60 ÷ 3).*
Y4	*Pupils practise to become fluent in the **formal** written method of **short division** with exact answers [NS]* **TU ÷ U; HTU ÷ U**	Recall division facts to 12 × 12. Use place value, known/derived facts to ÷ mentally, including ÷ by 1. Find effect of dividing U/TU by 10/100, identifying the value of the digits in the answer as units/tenths/hundredths.	*Practise mental methods and extend this to HTU numbers to derive facts, for example 200 x 3 = 600 into 600 ÷ 3 = 200. Relates decimal notation to division of whole number by 10 and later 100.*
Y5	Use the **formal** written method of **short division** (interpret remainders appropriately for the context). **HTU ÷ U** **ThHTU ÷ U** Convert between units of measure (eg km/m; m/cm; cm/mm; kg/g; litre and ml)	Identify multiples/factors, including finding all factor pairs of a number, & common factors of two numbers. Know/use vocabulary of prime numbers, prime factors and composite (non-prime) nos. Establish if a number up to 100 is prime; recall prime numbers to 19. ÷ nos mentally using known facts. Divide whole numbers and those involving decimals by 10/100/1000.	*Pupils … apply all the ÷ facts frequently, commit them to memory and use them to make larger calculations. They understand the terms factor, multiple/prime, square/cube numbers & use to construct equivalent statements [eg 120 ÷15 = (30 x 4) ÷ 15 = 2 x 4 = 8]*
Y6	Divide numbers (up to 4 digits) by TU whole number using the **formal** method of **short/long division** (interpret as approp. for the context). Use written division methods in cases where the ans has up to 2dp. *[Divide numbers up to 2dp by U/TU whole numbers.]*	Perform mental calculations, including with mixed operations/large numbers. Identify common factors/multiples and prime numbers. Use knowledge of order of operations to carry out calculations. Use estimation to check answers to calculations and determine an appropriate degree of accuracy. Identify value of each digit to 3dp and ÷ nos by 10/100/1000 (ans to 3dp)	*Undertake mental calcs with increasingly large numbers and more complex calculations.* *Continue to use all table facts to calculate statements in order to maintain their fluency.* *Explore the order of operations using brackets.* *Common factors can be related to finding equivalent fractions.*