WIDFORD LODGE

PREPARATORY SCHOOL

CALCULATION POLICY

THIS POLICY APPLIES TO ALL PUPILS AT WIDFORD LODGE SCHOOL INCLUDING THOSE IN THE EYFS

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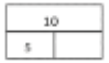
We hope you will find this policy useful. Included are some of the strategies that may be used to teach maths in each year group.

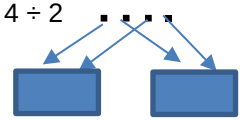
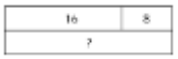
KEY STAGE 1

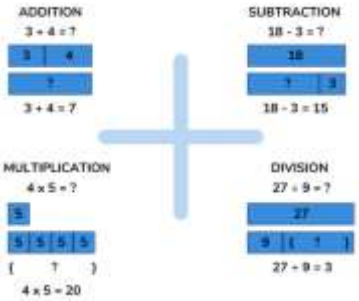
Children in Years 1 and 2 will be given a really solid foundation in the basic building blocks of mental and written arithmetic. Through being taught place value, children will develop an understanding of how numbers work, so that they are confident with 2-digit numbers and are beginning to read and say numbers above 100. Children and staff use the vocabulary Hundreds, Tens and Ones for place value.

Addition and Subtraction: A focus on number bonds, first via practical hands-on experiences and subsequently using memorisation techniques, enables a good grounding in these crucial facts, and ensures that all children leave Year 2 knowing the pairs of numbers which make all the numbers up to 10 at least. Children will also have experienced and been taught pairs to 20. Children's knowledge of number facts enables them to add several 1-digit numbers, and to add/subtract a 1-digit number to/from a 2-digit number. Another important conceptual tool is the ability to add/subtract 1 or 10, and to understand which digit changes and why. This understanding is extended to enable children to add and subtract multiples of 10 to and from any 2-digit number. The most important application of this knowledge is the ability to add or subtract any pair of 2-digit numbers by counting on or back in 10s and 1s. Children may extend this to adding by partitioning numbers into 10s and 1s.	**Multiplication and Division:** Children will be taught to count in 2s, 3s, 5s and 10s, and will relate this skill to repeated addition. Children will meet and begin to learn the associated ×2, ×3, ×5 and ×10 tables. Engaging in a practical way with the concept of repeated addition and the use of arrays enables children to develop a preliminary understanding of multiplication, and asking them to consider how many groups of a given number make a total will introduce them to the idea of division. Children will also be taught to double and halve numbers, and will thus experience scaling up or down as a further aspect of multiplication and division.	**Fractions:** Fractions will be introduced as numbers and as operators, specifically in relation to halves, quarters and thirds.

Year 1

	Mental calculation	Physical tools/Written calculation/Language used
Y1 **+**	Number bonds ('story' of 5, 6, 7, 8, 9 and 10) Count on in 1s from a given 2-digit number Add two 1-digit numbers Add three 1-digit numbers, spotting doubles or pairs to 10 Count on in 10s from any given 2-digit number Add 10 to any given 2-digit number Use number facts to add 1-digit numbers to 2-digit numbers e.g. *Use 4 + 3 to work out 24 + 3, 34 + 3* Add by putting the larger number first	Children will use fingers, cubes, number lines and 100 squares, Numicon, bar model method Example of bar model:  They will use the + and – sign when recording calculations and will record them horizontally only, not using vertical column addition/subtraction 4+2= 4+ _ = 6= _+2 25 / \ 20 5 10+?=12 **Vocabulary** Add, plus, one more, one less, bonds, partitioning, makes, equal, more, fewer

Y1 –	Number bonds ('story' of 5, 6, 7, 8, 9 and 10) Count back in 1s from a given 2-digit number Subtract one 1-digit number from another Count back in 10s from any given 2-digit number Subtract 10 from any given 2-digit number Use number facts to subtract 1-digit numbers from 2-digit numbers e.g. *Use 7 – 2 to work out 27 – 2, 37 – 2*	Children will use fingers, cubes, number lines and 100 squares, Numicon, bar model method They will use the + and – sign when recording calculations and will record them horizontally only, not using vertical column addition/subtraction **Vocabulary** subtract, one more, one less, bonds, partitioning, makes equal, more, fewer,
Y1 ×	Begin to count in 2s, 5s and 10s Begin to say what three 5s are by counting in 5s, or what four 2s are by counting in 2s, etc. Double numbers to 10	Children will count up in multiples of 2s, 5s and 10s, using the language of lots of The x sign is introduced Use the bar model method 6 X 2 ****** ****** objects **Vocabulary** Double, lots of, groups
Y1 ÷	Begin to count in 2s, 5s and 10s Find half of even numbers to 12 and know it is hard to halve odd numbers Find half of even numbers by sharing Begin to use visual and concrete arrays or 'sets of' to find how many sets of a small number make a larger number	Children will use cubes to introduce the concept of sharing, bar model method 6 ÷ 2 using objects 4 ÷ 2  Vocabulary Sharing, halve, groups of
Year 2		
	Mental calculation	**Physical tools/Written calculation/Language used**
Y2 +	Number bonds – know all the pairs of numbers which make all the numbers to 12, and pairs with a total of 20 Count on in 1s and 10s from any given 2-digit number Add two or three 1-digit numbers Add a 1-digit number to any 2-digit number using number facts, including bridging multiples of 10	Children will use fingers, cubes, number lines, 100 and 200 square, base 10, bar model method, numicon Example of bar model:  They record addition sums horizontally, not in vertical column format, using the language of + and they count on

	e.g. *45 + 4* e.g. *38 + 7* Add 10 and small multiples of 10 to any given 2-digit number Add any pair of 2-digit numbers	For 2 digit number addition, children talk about making strings with the tens and ones and if the ones make a ten or greater, they talk about jumping over to the tens 4+2= 4+ _ = 6 6= _+2 25 / \ 20 5  **Vocabulary** Add, plus, one more, one less, bonds, partitioning, makes, equal, more, fewer, increase, sum, more, and, together, total
Y2 –	Number bonds – know all the pairs of numbers which make all the numbers to 12 Count back in 1s and 10s from any given 2-digit number Subtract a 1-digit number from any 2-digit number using number facts, including bridging multiples of 10 e.g. *56 – 3* e.g. *53 – 5* Subtract 10 and small multiples of 10 from any given 2-digit number Subtract any pair of 2-digit numbers by counting back in 10s and 1s or by counting up	Children will use fingers, cubes, number lines, 100 and 200 square, base 10, bar model method All written subtractions will be recorded horizontally, not using vertical column subtraction Children will generally subtract by counting back in tens and 1s, but for sums with a larger difference they will count up from the smaller number to the larger, using a bridge to make the jumps, eg 42 – 27 27 up to 30 = 3; 30 up to 40 = 10; 40 up to 42 = 2. Add up the jumps = 15 As they develop more confidence they will increasingly use number bonds and may count up in 50s or 100s **Vocabulary** Take away, subtract, minus, decrease, fewer

Y2 **×**	Count in 2s, 5s and 10s Begin to count in 3s Begin to understand that multiplication is repeated addition and to use arrays e.g. *3 × 4 is three rows of 4 dots* Begin to learn the ×2, ×3, ×5 and ×10 tables, seeing these as 'lots of' e.g. *5 lots of 2, 6 lots of 2, 7 lots of 2* Double numbers up to 20 Begin to double multiples of 5 to 100 Begin to double 2-digit numbers less than 50 with 1s digits of 1, 2, 3, 4 or 5	Children count up in multiples of 2, 3, 5 and 10 using fingers to count the multiples, so that they can easily state that 6 lots of 5 = 30 etc. Use the bar model method They record their multiples as 3 x 4 = 12 for example Group objects such as cubes and beads **Vocabulary** Double, lots of, groups, times tables, multiply
Y2 **÷**	Count in 2s, 5s and 10s Begin to count in 3s Using fingers, say where a given number is in the 2s, 5s or 10s count e.g. *8 is the fourth number when I count in 2s* Relate division to grouping e.g. *How many groups of 5 in 15?* Halve numbers to 20 Begin to halve numbers to 40 and multiples of 10 to 100 Find $^1/_2$, $^1/_3$, $^1/_4$, $^3/_4$ of a quantity of objects and of amounts (whole nos)	Use the bar model method The ÷ sign is introduced as the opposite of multiplying and is recorded in sums Use objects to group/share Children will record fractions of amounts such as ½ of 20 = 10 etc **Vocabulary** Shared equally,share, halves, groups, divide into

LOWER KEY STAGE 2

In Lower Key Stage 2, children build on the concrete and conceptual understandings they have gained in Key Stage 1 to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers. Children and staff use the vocabulary Hundreds, Tens and Ones for place value

Addition and subtraction: Children are taught to use place value and number facts to add and subtract numbers mentally and they will develop a range of strategies to enable them to discard the 'counting in 1s' or fingers-based methods of Key Stage 1. In particular, children will learn to add and subtract multiples and near multiples of 10, 100 and 1000, and will become fluent in complementary addition as an accurate means of achieving fast and accurate answers to 3-digit subtractions. Standard written methods for adding larger numbers are taught, learned and consolidated, and written column subtraction is also introduced.	**Multiplication and division:** This key stage is also the period during which all the multiplication and division facts are thoroughly memorised, including all facts up to 12 × 12. Efficient written methods for multiplying or dividing a 2-digit or 3-digit number by a 1-digit number are taught, as are mental strategies for multiplication or division with large but 'friendly' numbers, e.g. when dividing by 5 or multiplying by 20.	**Fractions and decimals:** Children will develop their understanding of fractions, learning to reduce a fraction to its simplest form, as well as finding non-unit fractions of amounts and quantities. The concept of a decimal number is introduced and children consolidate a firm understanding of 1-place decimals, multiplying and dividing whole numbers by 10 and 100.

Year 3

	Mental calculation	Physical tools/Written calculation/Language used
Y3 +	Know pairs with each total to 20 e.g. *2 + 6 = 8, 12 + 6 = 18, 7 + 8 = 15* Know pairs of multiples of 10 with a total of 100 Add any two 2-digit numbers by counting on in 10s and 1s or by using partitioning Add multiples and near multiples of 10 and 100 Perform place-value additions without a struggle e.g. *300 + 8 + 50 = 358* Use place value and number facts to add a 1-digit or 2-digit number to a 3-digit number e.g. *104 + 56 is 160 since 104 + 50 = 154 and 6 + 4 = 10* *676 + 8 is 684 since 8 = 4 + 4 and 76 + 4 + 4 = 84* Add pairs of 'friendly' 3-digit numbers e.g. *320 + 450* Begin to add amounts of money using partitioning	Children may use the 100 square for support, bar model method Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers eg 431 + 27 becomes 400 + 30 + 1 + 20 + 7 400 + 50 + 8 Begin to use compact (standard vertical) column addition to add numbers with 3 digits, with the concept of 'on the doorstep' where ones or tens move across to the next place value column Begin to add like fractions e.g. $^3/_8 + {}^1/_8 + {}^1/_8$ Recognise fractions that add to 1 e.g. $^1/_4 + {}^3/_4$ e.g. $^3/_5 + {}^2/_5$ Vocabulary: Add, plus, increase, sum, more, and, together, total

Y3 –	Know pairs with each total to 20 e.g. *8 – 2 = 6* e.g. *18 – 6 = 12* e.g. *15 – 8 = 7* Subtract any two 2-digit numbers Perform place-value subtractions without a struggle e.g. *536 – 30 = 506* Subtract 2-digit numbers from numbers > 100 by counting up e.g. *143 – 76 is done by starting at 76. Then add 4 (80), then add 20 (100), then add 43, making the difference a total of 67* Subtract multiples and near multiples of 10 and 100 Subtract, when appropriate, by counting back or taking away, using place value and number facts Find change from £1, £5 and £10	Use the bar model method Use the counting up bridge method as an informal written strategy for subtracting pairs of 3-digit numbers e.g. *423 – 357* *357 up to 360 = 3; 360 up to 400 = 40; 400 up to 423 = 23* *3 + 40 + 23 = 66* Vertical column subtraction introduced: 561 - 42 'exchanging' from the T's etc Vertical column subtraction introduced with the concept begin to subtract like fractions *E.G 7/8 – 3/8 = 4/8* **Vocabulary** Take away, subtract, minus, decrease, fewer, difference between
Y3 ×	Know by heart all the multiplication facts in the ×2, ×3, ×4, ×5, ×8 and ×10 tables Multiply whole numbers by 10 and 100 Recognise that multiplication is commutative Use place value and number facts in mental multiplication e.g. *30 × 5 is 15 × 10* Partition teen numbers to multiply by a 1-digit number e.g. *3 × 14 as 3 × 10 and 3 × 4* Double numbers up to 50	Use the bar model method Use partitioning to multiply 2-digit and 3-digit numbers by 'friendly' 1-digit numbers, so for example to multiply 47 x 5 47 x 5 40 x 5 = 200 7 x 5 = 35 + 235 Followed by; 47 x5 35 (5x7) + 200 (5x40) 235 Vocabulary Multiply, product, times, lots of

Y3 **÷**	Know by heart all the division facts derived from the ×2, ×3, ×4, ×5, ×8 and ×10 tables Divide whole numbers by 10 or 100 to give whole number answers Recognise that division is not commutative Use place value and number facts in mental division e.g. *84 ÷ 4 is half of 42* Divide larger numbers mentally by subtracting the 10th multiple as appropriate, including those with remainders e.g. *57 ÷ 3 is 10 + 9 as 10 × 3 = 30 and 9 × 3 = 27* Halve even numbers to 100, halve odd numbers to 20	Children talk about the ÷ sign acting as a knife, cutting up the numbers Use the bar model method Perform divisions just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number 121 ÷4 = 30r1 4x?= 121 10x4= -40 81 10x4= -40 41 10x4= -40 1 Find unit fractions of quantities and begin to find non-unit fractions of quantities: 1/5 of 25 = 5, so 2/5 of 25 = 10 Vocabulary Lots of, chunking, groups, sharing
Year 4		
	Mental calculation	**Written calculation/Language used**
Y4 **+**	Add any two 2-digit numbers by partitioning or counting on Know by heart/quickly derive number bonds to 100 and to £1 Add to the next 100, £1 and whole number e.g. *234 + 66 = 300* e.g. *3·4 + 0·6 = 4* Perform place-value additions without a struggle e.g. *300 + 8 + 50 + 4000 = 4358* Add multiples and near multiples of 10, 100 and 1000 Add £1, 10p, 1p to amounts of money Use place value and number facts to add 1-, 2-, 3- and 4-digit numbers where a mental calculation is appropriate e.g. *4004 + 156 by knowing that 6 + 4 = 10 and that 4004 + 150 = 4154 so the total is 4160*	Column addition for 3-digit and 4-digit numbers, bar model method e.g. *5 3 4 7* + *2 2 8 6* *1 4 9 5* --- 9 1 2 8 --- 1 2 1 (on the doormat) Add like fractions

		e.g. $^{3}/_{5} + {}^{4}/_{5} = {}^{7}/_{5} = 1\ {}^{2}/_{5}$ Be confident with fractions that add to 1 and fraction complements to 1 e.g. $^{2}/_{3} + \_ = 1$
Y4 –	Subtract any two 2-digit numbers Know by heart/quickly derive number bonds to 100 Perform place-value subtractions without a struggle e.g. *4736 – 706 = 4030* Subtract multiples and near multiples of 10, 100, 1000, £1 and 10p Subtract multiples of 0·1 Subtract by counting up e.g. *503 – 368 is done by adding* *368 + 2 + 30 + 100 + 3 (so we added 135)* Subtract, when appropriate, by counting back or taking away, using place value and number facts Subtract £1, 10p, 1p from amounts of money Find change from £10, £20 and £50	Use counting back Use number line and count up in jumps Use the bar model method Use expanded column subtraction for 3- and 4 digit numbers 2345 2000 300 40 5 -1234 -1000 200 30 4 1111 1000 100 10 1 = 1111 Use complementary addition to subtract amounts of money, and for subtractions where the larger number is a near multiple of 1000 or 100 e.g. *2002 – 1865* Use compact vertical column subtraction, exchanging digits where necessary Vertical column subtraction 561 - 42 'exchanging' from the T's etc. _____ Subtract like fractions e.g. $^{4}/_{5} - {}^{3}/_{5} = {}^{1}/_{5}$ Use fractions that add to 1 to find fraction complements to 1 e.g. $1 - {}^{2}/_{3} = {}^{1}/_{3}$
Y4 ×	Know by heart all the multiplication facts up to 12 × 12 Recognise factors up to 12 of 2-digit numbers Multiply whole numbers and 1-place decimals by 10, 100, 1000 Multiply multiples of 10, 100 and 1000 by 1-digit numbers e.g. *300 × 6* e.g. *4000 × 8*	Use the bar model method Use a vertical written method to multiply a 1-digit number by a 3-digit number (ladder method) e.g. *324* *X 5* ---------

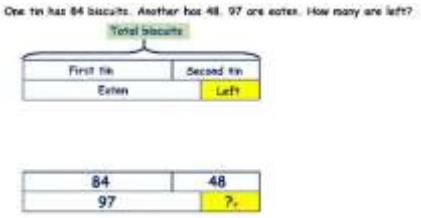
	Use understanding of place value and number facts in mental multiplication e.g. *36 × 5 is half of 36 × 10* e.g. *50 × 60 = 3000* Partition 2-digit numbers to multiply by a 1-digit number mentally e.g. *4 × 24 as 4 × 20 and 4 × 4* Multiply near multiples by rounding e.g. *33 × 19 as (33 × 20) – 33* Find doubles to double 100 and beyond using partitioning Begin to double amounts of money e.g. *£35·60 doubled is £71·20*	*20 (4x5)* *100 (5x20)* *15 00 (5x300)* -------- 1620 Use an efficient written method to multiply a 2-digit number by a number between 10 and 20 by partitioning Vocabulary product, times, lots of, multiply
Y4 **÷**	Know by heart all the division facts up to 144 ÷ 12 Divide whole numbers by 10, 100, to give whole number answers or answers with 1 decimal place Divide multiples of 100 by 1-digit numbers using division facts e.g. *3200 ÷ 8 = 400* Use place value and number facts in mental division e.g. *245 ÷ 20 is half of 245 ÷ 10* Divide larger numbers mentally by subtracting the 10th or 20th multiple as appropriate e.g. *156 ÷ 6 is 20 + 6 as 20 × 6 = 120 and 6 × 6 = 36* Find halves of even numbers to 200 and beyond using partitioning Begin to halve amounts of money e.g. *half of £52·40 is £26·20*	Use the bar model method Use a written method to divide a 2-digit or a 3-digit number by a 1-digit number, 'chunking' to find known multiples to subtract, and extending to using the 'bus stop' 21 3 / 63 -30 (10x3) 33 -30 (10x3) 3 -3 (1x3) 0 Give remainders as whole numbers Begin to reduce fractions to their simplest forms Find unit and non-unit fractions of larger amounts Start to find 50%, 10%, 25% of amounts Vocabulary Lots of, chunking, groups, sharing

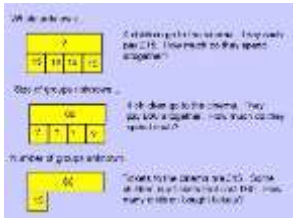
UPPER KEY STAGE 2

Children move on from dealing mainly with whole numbers to performing arithmetic operations with both decimals and fractions.

Addition and subtraction: Children will consolidate their use of written procedures in adding and subtracting whole numbers with up to 6 digits and also decimal numbers with up to 2 decimal places. Mental strategies for adding and subtracting increasingly large numbers will also be taught. These will draw upon children's robust understanding of place value and knowledge of number facts. Negative numbers will be added and subtracted.	**Multiplication and division:** Efficient and flexible strategies for mental multiplication and division are taught and practised, so that children can perform appropriate calculations even when the numbers are large, such as *40 000 × 6* or *40 000 ÷ 8*. In addition, it is in Years 5 and 6 that children extend their knowledge and confidence in using written algorithms for multiplication and division.	**Fractions, decimals, percentages and ratio:** Fractions and decimals are also added, subtracted, divided and multiplied, within the bounds of children's understanding of these more complicated numbers. Children will also calculate simple percentages and ratios.

Year 5

	Mental calculation	Written calculation/Language used
Y5 +	Know number bonds to 1 and to the next whole number Add to the next 10 from a decimal number e.g. *13·6 + 6·4 = 20* Add numbers with 2 significant digits only, using mental strategies e.g. *3·4 + 4·8* e.g. *23 000 + 47 000* Add 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000 e.g. *8000 + 7000* e.g. *600 000 + 700 000* Add near multiples of 10, 100, 1000, 10 000 and 100 000 to other numbers e.g. *82 472 + 30 004* Add decimal numbers which are near multiples of 1 or 10, including money e.g. *6·34 + 1·99* e.g. *£34·59 + £19·95* Use place value and number facts to add two or more 'friendly' numbers, including money and decimals e.g. *3 + 8 + 6 + 4 + 7* e.g. *0·6 + 0·7 + 0·4*	Use the bar model method  Use column addition to add two or three whole numbers with up to 5 digits Use column addition to add any pair of 2-place decimal numbers, including amounts of money Begin to add related fractions using equivalences (higher ability children will add mixed numbers and will find common denominators) e.g. $^1/_2 + {}^1/_6 = {}^3/_6 + {}^1/_6$ Choose the most efficient method in any given situation

	e.g. *2056 + 44*	
Y5 –	Subtract numbers with 2 significant digits only, using mental strategies e.g. *6·2 – 4·5* e.g. *72 000 – 47 000* Subtract 1- or 2-digit multiples of 10, 100, 1000, 10 000 and 100 000 e.g. *8000 – 3000* e.g. *60 000 – 200 000* Subtract 1- or 2-digit near multiples of 10, 100, 1000, 10 000 and 100 000 from other numbers e.g. *82 472 – 30 004* Subtract decimal numbers which are near multiples of 1 or 10, including money e.g. *6·34 – 1·99* e.g. *£34·59 – £19·95* Use counting up subtraction, with knowledge of number bonds to 10, 100 or £1, as a strategy to perform mental subtraction e.g. *£10 – £3·45* e.g. *1000 – 782* Recognise fraction complements to 1 and to the next whole number e.g. *1 $^2/_5$ + $^3/_5$ = 2*	Use the bar model method Use compact or expanded column subtraction to subtract numbers with up to 5 digits Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 Use complementary addition for subtractions of decimal numbers with up to 2 places, including amounts of money Begin to subtract related fractions using equivalences (higher ability will subtract mixed numbers and will find common denominators) e.g. $^1/_2$ – $^1/_6$ = $^2/_6$ Choose the most efficient method in any given situation **Vocabulary** Take away, minus, difference between, decrease, ‘steal’
Y5 ×	Know by heart all the multiplication facts up to 12 × 12 Multiply whole numbers and 1- and 2-place decimals by 10, 100, 1000, 10 000 Use knowledge of factors and multiples in multiplication e.g. *43 × 6 is double 43 × 3* e.g. *28 × 50 is $^1/_2$ of 28 × 100 = 1400* Use knowledge of place value and rounding in mental multiplication e.g. *67 × 199 as 67 × 200 – 67* Use doubling and halving as a strategy in mental multiplication e.g. *58 × 5 is half of 58 × 10* e.g. *34 × 4 is 34 doubled twice* Partition 2-digit numbers, including decimals, to multiply by a 1-digit number mentally e.g. *6 × 27 as 6 × 20 (120) plus 6 × 7 (42)*	Use the bar model method  Use short multiplication to multiply a 1-digit number by a number with up to 4 digits Use long multiplication to multiply 3-digit and 4-digit numbers by a number between 11 and 20 *324* *x15* --------

	e.g. *6·3 × 7 as 6 × 7 (42) plus 0·3 × 7 (2·1)* Double amounts of money by partitioning e.g. *£37·45 doubled is £37 doubled (£74) plus 45p doubled (90p) giving a total of £74·90*	*1620 (5x324)* *+ 3240 (10x324)* -------- 4860 Choose the most efficient method in any given situation Find simple percentages of amounts e.g. *10%, 5%, 20%, 15% and 50%* Begin to multiply fractions and mixed numbers by whole numbers ≤ 10 e.g. $4 \times {}^{2}/_{3} = {}^{8}/_{3} = 2\,{}^{2}/_{3}$ Understand that ¼ x 12 means ¼ of 12 etc Vocabulary Multiply, product, times, lots of
Y5 **÷**	Know by heart all the division facts up to 144 ÷ 12 Divide whole numbers by 10, 100, 1000, 10 000 to give whole number answers or answers with 1, 2 or 3 decimal places Use doubling and halving as mental division strategies e.g. *34 ÷ 5 is (34 ÷ 10) × 2* Use knowledge of multiples and factors, as well as tests for divisibility, in mental division e.g. *246 ÷ 6 is 123 ÷ 3* e.g. *We know that 525 divides by 25 and by 3* Halve amounts of money by partitioning e.g. $^{1}/_{2}$ *of £75·40 =* $^{1}/_{2}$ *of £75 (£37·50) plus half of 40p (20p) which is £37·70* Divide larger numbers mentally by subtracting the 10th or 100th multiple as appropriate	Use the bar model method Use the “bus stop” notation and finding known multiples to subtract, ‘chunking’ Use short division to divide a number with up to 4 digits by a number ≤ 12 0204 14/31 31 / 6336 Give remainders as whole numbers or as fractions or decimals Find non-unit fractions of large amounts Turn improper fractions into mixed numbers and vice versa Choose the most efficient method in any given situation Vocabulary Lots of, chunking, groups, sharing, divisor

	e.g. *96 ÷ 6 is 10 + 6, as 10 × 6 = 60 and 6 × 6 = 36* e.g. *312 ÷ 3 is 100 + 4 as 100 × 3 = 300 and 4 × 3 = 12* Know tests for divisibility by 2, 3, 4, 5, 6, 9 and 25 Know square numbers and cube numbers Reduce fractions to their simplest form	

Year 6		
	Mental calculation	**Written calculation**
Y6 +	Know by heart number bonds to 100 and use these to derive related facts e.g. *3·46 + 0·54* Derive, quickly and without difficulty, number bonds to 1000 Add small and large whole numbers where the use of place value or number facts makes the calculation do-able mentally e.g. *34 000 + 8000* Add multiples of powers of 10 and near multiples of the same e.g. *6345 + 199* Add negative numbers in a context such as temperature where the numbers make sense Add two 1-place decimal numbers or two 2-place decimal numbers less than 1 e.g. *4·5 + 6·3* e.g. *0·74 + 0·33* Add positive numbers to negative numbers e.g. *Calculate a rise in temperature or continue a sequence beginning with a negative number*	Use the bar model method Use column addition to add numbers with up to 5 digits Use column addition to add decimal numbers with up to 3 decimal places Add mixed numbers and fractions with different denominators
Y6 –	Use number bonds to 100 to perform mental subtraction of any pair of integers by complementary addition e.g. *1000 – 654 as 46 + 300 in our heads* Use number bonds to 1 and 10 to perform mental subtraction of any pair of 1-place or 2-place decimal numbers using complementary addition and including money e.g. *10 – 3·65 as 0·35 + 6* e.g. *£50 – £34·29 as 71p + £15* Use number facts and place value to perform mental subtraction of large numbers or decimal numbers with up to 2 places e.g. *467 900 – 3005* e.g. *4·63 – 1·02* Subtract multiples of powers of 10 and near multiples of the same Subtract negative numbers in a context such as temperature where the numbers make sense	Use the bar model method Use column subtraction to subtract numbers with up to 6 digits Use complementary addition for subtractions where the larger number is a multiple or near multiple of 1000 or 10 000 Use complementary addition for subtractions of decimal numbers with up to 3 places, including money Subtract mixed numbers and fractions with different denominators

Y6 **×**	Know by heart all the multiplication facts up to 12 × 12 Multiply whole numbers and decimals with up to 3 places by 10, 100 or 1000 e.g. *234 × 1000 = 234 000* e.g. *0·23 × 1000 = 230* Identify common factors, common multiples and prime numbers and use factors in mental multiplication e.g. *326 × 6 is 652 × 3 which is 1956* Use place value and number facts in mental multiplication e.g. *4000 × 6 = 24 000* e.g. *0·03 × 6 = 0·18* Use doubling and halving as mental multiplication strategies, including to multiply by 2, 4, 8, 5, 20, 50 and 25 e.g. *28 × 25 is a quarter of 28 × 100 = 700* Use rounding in mental multiplication e.g. *34 × 19 as (34 × 20) – 34* Multiply 1- and 2-place decimals by numbers up to and including 10 using place value and partitioning e.g. *3·6 × 4 is 12 + 2·4* e.g. *2·53 × 3 is 6 + 1·5 + 0·09* Double decimal numbers with up to 2 places using partitioning e.g. *36·73 doubled is double 36 (72) plus double 0·73 (1·46)*	Use the bar model method Use short multiplication to multiply a 1-digit number by a number with up to 4 digits Use long multiplication to multiply a 2-digit number by a number with up to 4 digits *324* *x15* -------- *1620 (5x324)* *+ 3240 (10x324)* -------- 4860 Use short multiplication to multiply a 1-digit number by a number with 1 or 2 decimal places, including amounts of money Multiply fractions and mixed numbers by whole numbers Multiply fractions by proper fractions Use percentages for comparison and calculate simple percentages Vocabulary Multiply, product, times
Y6 **÷**	Know by heart all the division facts up to 144 ÷ 12 Divide whole numbers by powers of 10 to give whole number answers or answers with up to 3 decimal places Identify common factors, common multiples and primes numbers and use factors in mental division e.g. *438 ÷ 6 is 219 ÷ 3 which is 73* Use tests for divisibility to aid mental calculation Use doubling and halving as mental division strategies, for example to divide by 2, 4, 8, 5, 20 and 25	Use the bar model method Use short division to divide a number with up to 4 digits by a 1-digit or a 2-digit number 2112 3 ⟌ 6336 Use long division to divide 3-digit and 4-digit numbers by ‘friendly’ 2-digit numbers 018 (notes) 25 ⟌ 450 5x25=125 10x25=250 Give remainders as whole numbers or as fractions or as decimals

	e.g. *628 ÷ 8 is halved three times:* *314, 157, 78·5* Divide 1- and 2-place decimals by numbers up to and including 10 using place value e.g. *2·4 ÷ 6 = 0·4* e.g. *0·65 ÷ 5 = 0·13* e.g. *£6·33 ÷ 3 = £2·11* Halve decimal numbers with up to 2 places using partitioning e.g. *Half of 36·86 is half of 36 (18) plus half of 0·86 (0·43)* Know and use equivalence between simple fractions, decimals and percentages, including in different contexts Recognise a given ratio and reduce a given ratio to its lowest terms	Divide a 1-place or a 2-place decimal number by a number ≤ 12 using multiples of the divisors Divide proper fractions by whole numbers Vocabulary Lots of, chunking, groups, sharing, quotient, divisor