Calculation Policy for All Saints First School Denstone, St Peter's Alton and St Augustine's Draycott.

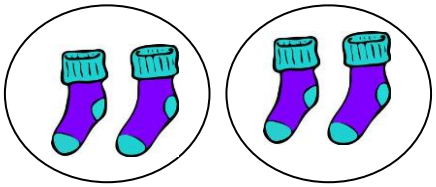
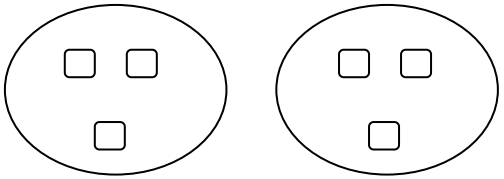
We aim to offer the children a solid foundation in the basics of the four operations, which they will build upon and develop a real mathematical understanding, as they move through the schools.

The guidance in italics is taken from the non- statutory guidance in the 'National Curriculum in England' document for 2014

Early Years Foundation Stage

Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems. Maths for young children should be meaningful. Where possible, concepts should be taught in the context of real life.			
	Expectations	What this will look like	Key Points
EYFS +	Begin to combine groups of objects by count them all. Add 2 single digit numbers by counting on. Solve simple problems. Find one more than a given number. Use the correct language relating to addition.	Practical, counting objects and relating addition to combining two groups of objects. Construct number sentences verbally and practically. Use number tracks, fingers and other practical resources. Check 1:1 correspondence when counting objects. 	• Use story telling • Relate it to the world we live in • When children have counted, get them to count again to check • Use songs and rhymes • Children to understand addition as combining two or more sets of objects.

		Singing songs and rhymes.	
EYFS -	Relate subtraction to taking away and counting how many are left. Solve simple problems. Subtract 2 single digit numbers by count back. Find one less than a given number. Use the correct language relating to subtraction.	Teacher modelling, pictorial representation. Practical demonstrations of subtraction relating to 'take away'. E.g. 10 – 1? Use of number tracks, fingers and other practical resources. Vocabulary of subtraction in practical activities.  Use songs and rhymes, etc. e.g. Sing ten green bottles.	• Use story telling • Relate it to the world we live in • When children have counted, get them to count again to check • Use songs and rhymes • Children to understand subtraction as taking away.
EYFS X	The link between addition and multiplication can be introduced through doubling. Grouping objects. Counting in twos, fives and tens (exceeding).	Jumping along number tracks in steps of…. 100 square to look at patterns of multiples. Grouping- counting in equal sized groups. Use concrete resources counters, cubes, etc. Begin counting in steps of 2 and 10  Songs and rhymes. Real life stories.	• Use songs and rhymes • Use pictorial representations. • Real life contexts and the use of practical equipment.

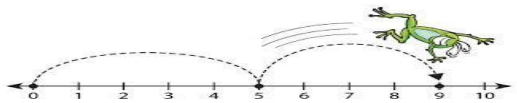
EYFS ÷	Solve problems involving halving and sharing. Children need to see and hear representations of division as both grouping and sharing.	Share the biscuits out so that everyone has the same number. Cut the sandwich in half. How many pieces are there?  Grouping model – Mum has 4 socks. She groups them into pairs. How many pairs does she have?  Sharing model – I have 6 sweets. I share them with my friend. How many will we each have? 	• Use songs and rhymes • Use pictorial representations. • Real life contexts and the use of practical equipment.

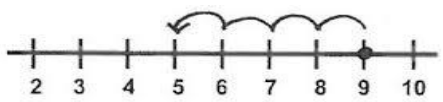
Key Stage 1

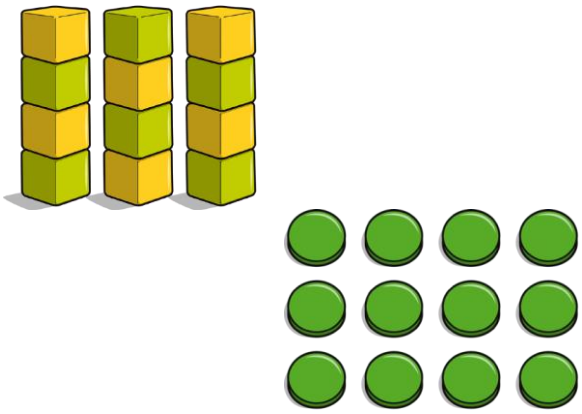
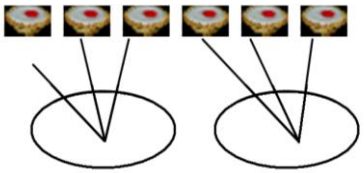
Children in Years 1 and 2 will be given a really solid foundation in the basic building blocks of mental and written arithmetic. Through being taught place value, children will develop an understanding of how numbers work, so that they are confident with 2-digit numbers and beginning to read and say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

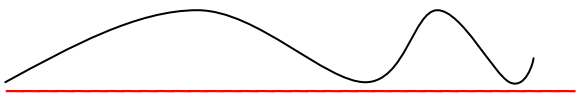
Year 1

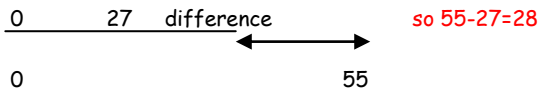
	Expectations	What will this look like?	Key Points
Y1 **+**	Number bonds ('story' of 5, 6, 7, 8, 9 and 10) Count on in 1s from a given 2-digit number Add two 1-digit numbers Add three 1-digit numbers, spotting doubles or pairs to 10	Develop pupils' understanding of addition with practical activities using concrete apparatus such as bundle of straws and counters. Use of the number track and number line-	Continue to develop pupils' understanding of addition with practical activities using concrete apparatus, such as bundles of straws, Dienes, counters and Base Ten *Read, write and interpret involving add (+) and equals (=) sign.* TEACH THE EQUAL

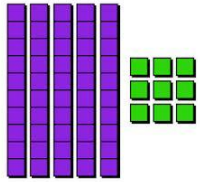
	Count on in 10s from any given 2-digit number Add 10 to any given 2-digit number Use number facts to add 1-digit numbers to 2-digit numbers e.g. *Use 4 + 3 to work out 24 + 3, 34 + 3* Add by putting the larger number first	hopping and recording 1 2 3 4 5  Missing number problems 2 + 3 = △ □ + △ = 4 10 = 6 + △ 5 + 3 + 1 = 9	SIGN AS MEANING 'THE SAME AS' *Show children addition can be done in any order.* *USE OF CONCRETE APPARATUS*  • All numbers should be marked on number lines for them to see. • Significant numbers should be emboldened. **Children to record pictorially progressing to recording number sentences alongside**
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	Use concrete apparatus to experience take away and difference in practical activities. Count out sixteen straws and if you give your friend seven. How many will you have left? Number tracks leading to number lines introduced for recording 'jumps.' Can you count back 5? Take away 5? 1 2 3 4 5	They should realise the effect of adding or subtracting zero. This establishes addition and subtraction as related operations. Pupils combine and increase numbers, counting forwards and backwards. They discuss and solve one step problems in familiar practical contexts, including using quantities. Problems should include the terms put together, add, altogether, total, take away, distance between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to

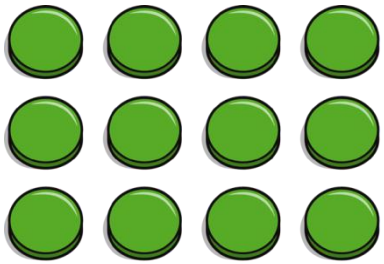
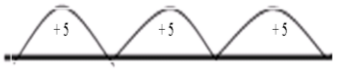
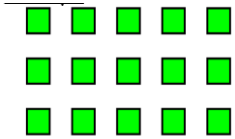
	e.g. Use 7 – 2 to work out 27 – 2, 37 – 2	 Difference introduced practically and then on number tracks and lines. E.g 12 - 7 *Can you make a rod 12 blocks long? My block is 7 blocks long. What's the difference?* ———————*difference* *0 1 2 3 4 5 6 7* ———————► 0 1 2 3 4 5 6 7 8 9 10 11 12	use these operations flexibly. Mostly mental calculations with children making informal jottings leading to introduction of number sentence. Understanding subtraction as "take away" and find a small "difference "by counting up. Use informal written methods to support the subtraction of a 1-digit number from a 1-digit number or a 2 –digit number and a multiple of 10 from a 2-digit number **<u>Teach through real life situations, songs and rhymes</u>** When using number lines, ensure the children recognise the difference between an empty number line and one that is labelled.
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	Pupils solve one step problems involving multiplication by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. Three lots of 4	They make connections between arrays, number patterns, and counting in twos, fives and tens. Begin steps of 3. Solve practical problems involving groups of

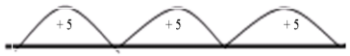
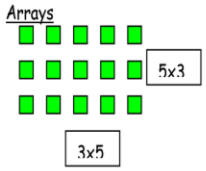
			2, 5 or 10- draw pictures or groups. When ready link to jumps on a number line. Doubling numbers (numbers up to 20) and quantities Find simple fractions of objects, numbers and quantities.
Y1 ÷	Begin to count in 2s, 5s and 10s Find half of even numbers to 12 and know it is hard to halve odd numbers Find 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.	Pupils solve one- step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher. Pupils using sharing and grouping to solve division problems. Sharing 6 cakes are shared equally between 2 people. How many cakes does each person get?  Grouping	Teach through storytelling and real life situations. Use of pictures, or number tracks (Use tracks first only move onto number lines when confident) or number lines, to count on in equal groups and solve problems. Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities. They make connections between arrays, number patterns, and counting in twos, fives and tens.

		How many pairs of socks can we make from this pile of socks? Count the pairs 	
Year 2			
	Expectations	**What will this look like?**	**Key Points**
Y2 **+**	Number bonds – know all the pairs of numbers for totals up to 20. Count on in 1s and 10s from any given 2-digit number Add two or three 1-digit numbers Use addition and subtraction facts to 20 to derive related facts to 100. Add a 1-digit number to any 2-digit number using number facts, including bridging multiples of 10 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	Use the number line to calculate with bigger numbers, partitioning the smaller number and adding the most significant digit first. 52 + 24  52 (+20) 72 (+4) 76 Use number square to count on tens than ones. 61 + 14 = ☐ 12 + 7 + 4 = ☐	Add using concrete apparatus, visual representations and mental skills TU + U TU + multiples of 10 TU + TU U + U + U Children to understand addition as combining two or more sets of objects All children still need story telling to solve addition problems – put them into context. *'SUM' explain the language* • Add **<u>least</u>** significant figures first when working vertically They check their calculations, including by

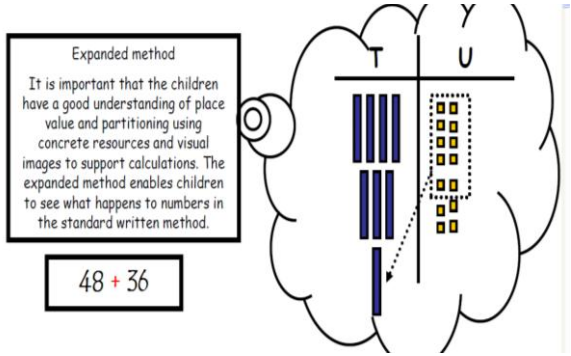
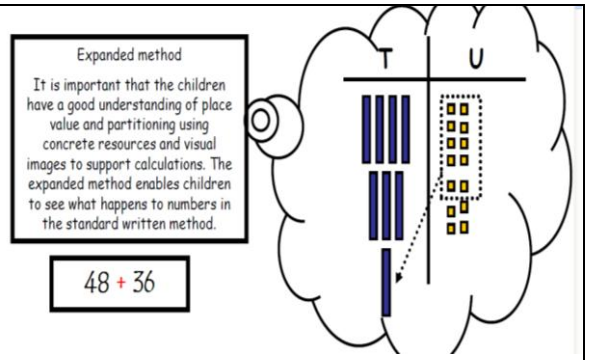
	When children have a good understanding of place value and partitioning, introduce the columnar methods with additions that do not cross the tens boundary using concrete apparatus laid out in a columnar form.	Column addition 23 +35	adding to check subtraction and adding numbers in a different order to check addition (e.g. 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition.
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. Introduce children to subtractions using expanded columnar methods.	Practice finding the difference by counting on using a number line. They are able to choose when to take away and when to find the difference when answering a subtraction problem.   27(+3) 30 (+20) 50 (+5) 55 55 – 27 = 28 27 + ? = 55 55 – ? = 27 Use concrete apparatus to explore exchange in practical activities. E.g. Subtract 18p from 33p.	Pupils will solve subtraction problems in a real life context. Use the inverse relationship between addition and subtraction. To understand that subtraction cannot be done in any order. They will check their calculations. Pupils should partition numbers in different ways for example 23 = 20 +3 and 23 =10 + 13 to support subtraction. Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers. Teach through real life situations and use concrete objects and visual representations including number quantities and measures. Use Base Ten/Dienes to show exchange.

		 Expanded column subtraction. 87 – 54 80 7 -50 4 30 3	 Teach children to look for special cases i.e. take away a small amount (55-2=53) and by counting back -9 by compensation 34 – 9 = 34 –10 and then add one back.
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	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the signs. 4 x 3 = 12 3 x 4 = 12 12 ÷ 3 = 4 12 ÷ 4 = 3 Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication facts.	Count in steps 2, *3*, and 5 from 0 and in tens from any number forward and backward. Pupils use a variety of language to describe multiplication and division. Pupils are introduced to the multiplication tables. They practise to become fluent in the **2, 5 and 10 multiplication tables** and connect them to each other (division) including odd and even number (i.e. if it's an even number it will be a multiple of 2) They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face.

	with 1s digits of 1, 2, 3, 4 or 5 Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts, e.g.	 4 x 3 = 3 friends have 5 pencils each. How many pencils do they have altogether?  5 x 3 = '5 multiplied by 3' or '5 times 3' or '5, three times' 5 x 3 	They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).

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 and 3/4 of a quantity of objects and of amounts (whole number answers)	Calculate mathematical statements for division within the multiplication tables and write them using the signs. 4 x 3 = 12 3 x 4 = 12 12 ÷ 3 = 4 12 ÷ 4 = 3 Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts, e.g. 15 pencils are put in boxes of 5. How many boxes of pencils will there be?  There will be 3 boxes of 5 pencils  Also use arrays 15 ÷ 5= 3 , 15 ÷ 3= 5	Teach through real life situations. Pupils use a variety of language to describe multiplication and division. Pupils are introduced to the multiplication tables. They practise to become fluent in the 2, 5 and 10 multiplication tables and connect 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 work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. They begin to relate these to fractions and measures (for example, 40÷ 2 = 20, 20 is a half of 40). They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).

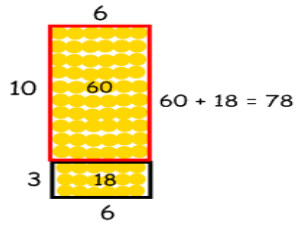
LOWER KEY STAGE 2			
In Lower Key Stage 2, children build on the concrete and conceptual understandings they have gained in Key Stage 1 to develop a real mathematical understanding of the four operations, in particular developing arithmetical competence in relation to larger numbers.			
Addition and 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			
	Expectations	**What will this look like?**	**Key points**

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	Use expanded column addition to add two or three 3-digit numbers or three 2-digit numbers.  1 2 4 or 100 20 4 +1 3 7 + 100 30 7 _____ _____ 1 1 200 50 11 = 261 5 0 2 0 0 _____ 2 6 1 Begin to use compact column addition to add numbers with 3 digits e.g 1 2 4 + 1 3 7	 HTU + U HTU + multiples of 10 HTU + multiples of 100 Estimate the answer to a calculation and use inverse operation to check answers. • Number lines to be used alongside the concrete apparatus • Mental use a number line for jottings • Written use columnar method • Leading on to vertical layout and understanding importance of lining up units/tens under tens etc HTU + TU, then HTU + HTU Cross 10s/100s barrier • Add **least** significant figures first

		2 6 1 1 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. $^{3}/_{5} + {}^{2}/_{5}$	when working vertically. • Mental before written
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 and progress to subtract numbers with up to 3-digits, 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	Use counting up as an informal written strategy for subtracting pairs of 3-digit numbers. e.g. 423 – 357  357 + 3 360 + 40 400 +23 423 3 + 40+ 23 = 66 So 423 – 357 = 66 Subtraction using column subtraction, expanded first and then move on to 3-digit numbers. 187 – 54 100 80 7	Estimate the answer to a calculation. Check answers with the inverse operation . They practise using columnar addition and subtraction with increasingly large numbers up to three digits to become fluent (from year 4). Solve problems including missing numbers and using number facts, It is important to continue to use concrete materials to aid understanding. Base Ten/Dienes to show exchange Coins/counters on a place value chart, number lines.

	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	- 50 4 100 30 3 = 133 **Progressing to:** (b) 81 – 57 = take away 81 = 80 1 - 57 - 50 7 *70 11* ~~80~~ ~~1~~ - 50 7 20 4 = 24 "1 take away 7 is tricky so exchange" Progressing to 7 1 ~~8~~ ~~1~~ - 5 7 2 4 Pupils progress to subtract numbers with up to 3 digits 341- 123 *30 11* 300 ~~40~~ ~~1~~ -100 20 3 200 10 8 or *30 11*	  

		341- 123 300 ~~40~~ 1 -100 20 3 200 10 8 **By the end children will have progressed to** 3 11 ~~341~~ -123 Begin to subtract like fractions e.g. 7/8 – 3/8	
Y3 **×**	Count from 0 in multiples of 4, 8, 50 and 100. 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	Build on their understanding of repeated addition and arrays to multiply two digits by one digit using tables they know, e.g. 13 x 3  Informal recording of partition numbers. 15 x 5 = 10 x 5 + 5 x 5 = 50 + 25 = 75 Link arrays to introduce grid multiplication to multiply TU by U , e.g. 13 x 6	Pupils continue to practise their mental recall of multiplication tables when they are calculating mathematical statements in order to improve fluency. **Recall and use multiplication and division facts for the 2, 3,4,5,6, 8 and10 times table.** Remember to use concrete apparatus and visual representations. Through doubling, they connect the 2, 4 and 8 multiplication tables. Pupils develop efficient mental methods, for

	number e.g. 3 × 14 as 3 × 10 and 3 × 4 Double numbers up to 50 Scaling	 Use partitioning (grid multiplication) to multiply 2-digit and 3-digit numbers by 'friendly' 1-digit numbers | x	20	3
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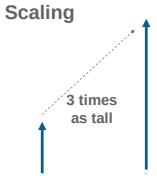
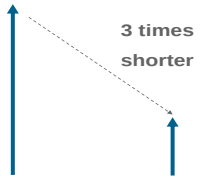
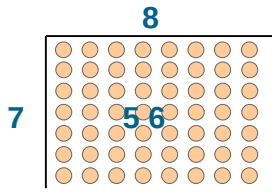
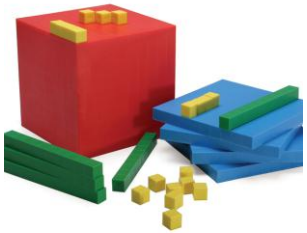
4	80	12 | = 92  Relate multiplication to scaling. My string is 12cm long. Cut a piece of string three times longer.	example, using commutativity and associativity (for example, 4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) and multiplication and division facts (for example, using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (for example, 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3). Pupils develop reliable written methods for multiplication and Division, starting with calculations of two-digit numbers by one-digit numbers. ONLY IF READY: progressing to the formal written methods of short multiplication and division. Pupils solve simple problems (including missing number problems) in contexts, deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?

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	Perform divisions just above the 10th multiple using horizontal or vertical jottings and understanding how to give a remainder as a whole number. Children use knowledge of multiplication facts and repeated addition to answer division questions. How many 3s are there in 39?  10x3 =30 3x3 =9 add together = 39 Extending to use all tables that pupils know and to explore the idea of the remainder. Pupils explore the use of scaling as a model for division, e.g. My ribbon is 24 cm long. Can you cut a ribbon 3 times shorter?  	Use a range of apparatus, including Base Ten, coins, counters, arrays. *Pupils develop efficient mental methods, for multiplication and division facts (for example, using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (for example, 30 × 2 = 60, 60 ÷ 3 = 20 and 20 = 60 ÷ 3).* *Pupils solve simple problems in context (including missing numbers), deciding which of the four operations to use and why. These include measuring and scaling contexts, (for example, four times as high, eight times as long etc.) and correspondence problems in which m objects are connected to n objects (for example, 3 hats and 4 coats, how many different outfits?; 12 sweets shared equally between 4 children; 4 cakes shared equally between 8 children).* *Use repeated subtraction – chunking*

		Pupils are introduced to the formal written method of short division with whole number answers, using the image of the array and place value apparatus initially.  Progress to using the formal written method of division. 98 ÷ 7 1 4 7 ⟌ 9 8 2 answer 14 Find unit fractions of quantities and begin to find non-unit fractions of quantities	*Ensure children see/understand the link between grouping on a number line and vertical recording for chunking.* *Pupils develop reliable written methods for division, starting with calculations of two-digit numbers by one-digit numbers and progressing to the formal written methods of short division. Only move on to this method when secure. (By Summer term)*

Year 4			
	Expectations	**What will this look like?**	**Key points**
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*	Column addition for 3-digit and 4-digit numbers e.g 625 + 48 + 673 = 1294 £ 7.89 + £ 6.42 = £14.31 1 1 1 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. $^{2}/_{3} + \_ = 1$*	Estimate and use inverse operations to check answers to a calculation. Pupils continue to practise both mental methods and columnar spacing addition and subtraction with increasingly large numbers to aid fluency. Use Base Ten equipment alongside these strategies.  Add **least** significant figures first when working vertically. Refer to the value of each digit e.g. 40 add 20 or 4 tens add 2 tens.

	4160 Solve 2 step problems in context-deciding which operations to use. Include numbers with up to **two decimal places** in the context of money and measure.		
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	Use expanded column subtraction for 3- and 4-digit numbers . 784 = 700 ~~70~~ 80 ~~1~~ 4 -56 50 6 700 20 8 = 728 Progressing to 7 1 7 ~~8~~ ~~4~~ - 5 6 7 2 8 **Progressing to 4 digit numbers and should be expected at the end of year 4.** 500 100 51 2754 = 2000 700 ~~50~~ 4 2~~7~~54 -1562 1000 500 60 2 1562 1192 1000 100 90 2 1192	Pupils continue to practise both mental methods and columnar spacing for addition and subtraction with increasingly large numbers to aid fluency. Estimate and check answers to calculations. Understand subtraction as the inverse of addition. Solve two-step problems in contexts, deciding which operations to use and why. Continue to support understanding with a range of concrete materials, including Base Ten to show exchange Coins/counters on a place value chart, number lines.

<table>
<tr>
<td></td>
<td>Find change from £10, £20 and £50

Subtract numbers with up to 4 digits, including up to 2 d.p. in the context of money and measure.

E.g. 26.21m – 11.29m (using end of year layout for calculation).</td>
<td>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

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</td>
<td></td>
</tr>
<tr>
<td>Y4
×</td>
<td>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 understanding of place value and number facts in mental multiplication</td>
<td>Use a grid written method to multiply a 1-digit number by a 3-digit number;

HTU x U using grid method e.g 136 x5

<table>
<tr><td>X</td><td>100</td><td>30</td><td>6</td></tr>
<tr><td>5</td><td>500</td><td>150</td><td>30</td></tr>
</table>
Progressing to the expanded short multiplication method

136 Moving to the formal written method
x 5 by the Summer term.</td>
<td>Recall and use multiplication and division facts for the 2, 3,4,5,6,7,8,9 and10 times table.

Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6).

Recognise and use factor pairs and commutativity in mental calculations.

Pupils practise solving problems to become fluent in the formal written method of short</td>
</tr>
</table>

	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	30 136 150 X 5 500 680 680 1 3 Use an efficient written method to multiply a 2-digit number by a 2-digit number by partitioning (grid method) 38 X72 x | 30 | 8 | 70 | 2100 | 560 | = 2660 + 2 | 60 | 16 | = 76 | | | 2736 Progressing to the expanded written form for TU xTU 72 X 38 16 (2x8) 560 (70 X8)	multiplication. ?? Pupils write statements about the equality of expressions (for example, use the distributive law (partitioning) 39 × 7 = 30 × 7 + 9 × 7 and associative law (2 × 3) × 4 = 2 × (3 × 4)). They combine their knowledge of number facts and rules of arithmetic to solve mental and written calculations for example, 2 x 6 x 5 = 10 x 6 = 60. Pupils solve two step problems in context choosing the operation. Relate multiplication to integer scaling, problems such as *n* objects are connected to *m* objects.

		60 (2 x 30) 2100 (70 x 30) 2736 1	
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	Pupils continue to use the number line to support mental division. Use a written method to divide a 2-digit or a 3-digit number by a 1-digit number 98 ÷ 7 1 4 2 7 9 8 answer 14 Extend to 3-digit number by a 1-digit number 257 ÷ 7 Estimate first by using a number line to count on, if appropriate then use formal written methods as above. Give remainders as whole numbers	*Pupils continue to practise recalling and using multiplication tables and* ***related division facts*** *to aid fluency (up to 12 x 12).* Children continue to use strategies used in year 3. *Pupils practise mental methods and extend this to three-digit numbers to derive facts, (for example 600 ÷ 3 = 200 can be derived from 2 x 3 = 6).* *Pupils practise to become fluent in the formal written method of short multiplication and short division with exact answers.* Pupils solve two step problems in context choosing the operation. E.g. Three cakes divided equally between 10 children.

	beyond using partitioning Begin to halve amounts of money e.g. half of £52·40 is £26·20	Begin to reduce fractions to their simplest forms Find unit and non-unit fractions of larger amounts	