Calculation Guidance – Canonbury Primary School

The ability to calculate mentally is central to good teaching and learning of mathematics. As children progress through the school they will need to develop ways of recording to support their thinking so that:

> *'By the end of Y6 children are equipped with mental, written and calculator methods that they can understand and use correctly'*
>
> *(Primary Framework, Guidance Paper, Calculation)*

This policy is intended to ensure consistency and progression from mental to written calculations throughout the school.
It is important that such a policy is discussed and agreed upon by the whole staff before it is implemented.

 Teachers should support and guide children through the following important stages:
- talk about mathematics using appropriate vocabulary
- develop the use of pictures, symbols and numerals to record (see Models and Images)
- use jottings to aid mental strategies.
- use an empty number line as a key model to support the teaching and learning of mental calculations.
- use an expanded method which leads to a standard method for each of the four operations.
- know when it is more efficient to use a mental or written method, or a calculator.
- Include on a weekly basis opportunities to embed skills through the using and applying strand Ma1 –this must include communication and reasoning

It is important that children do not abandon mental methods and jottings once written methods are introduced.
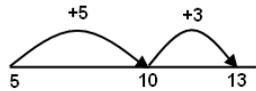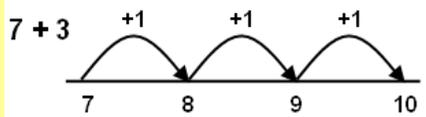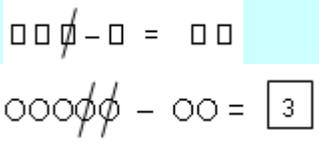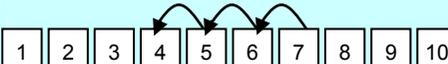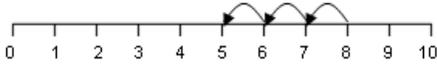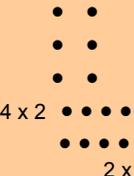
Once agreed the policy should be shared with teaching assistants and parents. It should be regularly reviewed with the whole staff to ensure that the methods are appropriate and being taught consistently. This policy will then become part of the school monitoring system.

For mathematics to be meaningful children must see the links to real life situations. This means that using and applying newly acquired skills within problem solving and investigative work is essential and should be embedded in most mathematics lessons reflecting the importance of mathematics in everyday life.
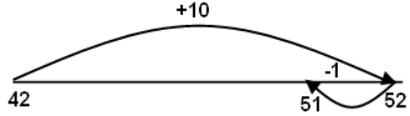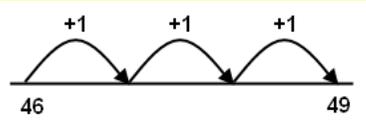
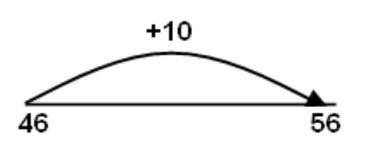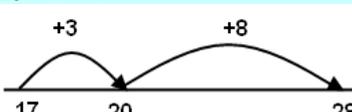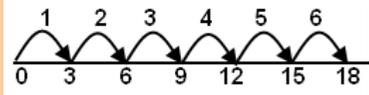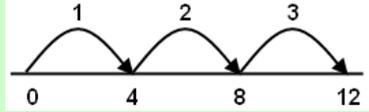Canonbury Primary Maths team – January 2011

Progression in calculation – Use models and images; counting on and back in ones and tens; ordering numbers to 100; partitioning and recombining; addition and subtraction facts to 20; understanding addition and subtraction; understanding multiplication and division

Year Group-Reception	Addition	Subtraction	Multiplication	Division
EYFS GOALS (4-9) Numbers as labels & for counting (problem solving, reasoning and numeracy) 4. Writes number names in sequence, counting to, or backwards from, at least 10. 5. Consistently recognises numerals in a range of contexts 6. Counts up to 10 objects & counts out a specified number of things from a larger collection showing 1:1 correspondence 7. Arranges in order a complete set of numbers fro 1-20 8. Solve problems and challenges by applying mathematical ideas and methods i.e. missing no, grouping, sharing and estimating 9. Has a secure understanding of numbers to 20, counting writing and recognising writing numbers accurately Calculating (problem solving reasoning and numeracy) 4. Finds how many in two groups by combing and counting 5. Using everyday objects, able to say how many are left after, say, eating, taking away or hiding, by counting those left 6. In practical contexts understanding and begins to use vocabulary involved in addition and subtraction, such as 'add', 'take away', 'altogether', 'how many' etc 7. Finds one more or fewer in practical contexts. Can talk about 'more' or 'less'. 8. Explores & solves practical problems such as doubling, halving, grouping & sharing, using own methods 9. Uses a range of strategies for addition and subtraction; displays mental recall of some addition and subtraction facts including doubles and pairs numbers that total 10	Find 1 more or 1 less than a number from 1 to 10 Add together Drawing objects Counting on Introduction to + sign Vocabulary: add, plus, equals, is, altogether (verbal) High attainers record 'more' Separate (partition) a given number of objects into two groups. Select two groups of objects to make a given total. Number songs and rhymes. Tallying/mark making	Find 1 more or 1 less than a number from 1 to 10 Take away practically Number track provided 0-10 Drawing Number line provided 0-20 Encourage recording on the number line 'Less' Begin to relate subtraction to 'taking away' and counting how many are left. Say how many are left when some are taken away, by counting back from the number Find out by counting up how many more will make a given number. Number songs and rhymes	Counting in 2s and 10s Using number line to count in 2 Number patterns on a 100 square	Sharing, grouping

Counting: Doubling and halving
Use vocabulary such as:
Double, half, halve, part
- How many shoelace holes are there?
- How many slices of bread do we need to make 4 whole sandwiches for the café?
- How many eggs will fill this box?
- Can you cut the cake in half? How many pieces?
- Fill half the tarts with strawberry jam and half with lemon curd.
- How many cakes in the box? Take half of them out. How many are left?
- Put half of: the cows in the field, cars in the garage, bears in the forest etc
- How many pairs of socks are there in the laundrette? Are there any left over?
- Find a partner. How any children are there? How many pairs?

Counting: repeated addition, grouping or sharing
Use vocabulary such as: share, group, left over, how many times?
- How many wheels do we need for these three Lego cars?
- How should we plant the daffodil bulbs in these three pots?
- Is there a way of doing it so that they all have the same number? Are there any left over?
- Count out these stickers round the circle of children? How many times will they go round? Are there any left over?
- Can we share out these cakes fairly? How shall we do it?

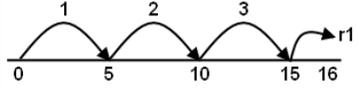**Recording for a purpose (informal)**

Progression in calculation – Use models and images; counting on and back in ones and tens; ordering numbers to 100; partitioning and recombining; addition and subtraction facts to 20; understanding addition and subtraction; understanding multiplication and division

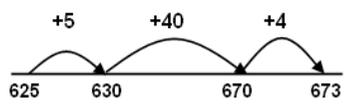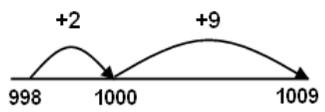| Year Group -One	Addition	Subtraction	Multiplication	Division
PRIMARY FRAMEWORK OBJECTIVES: Counting and understanding number -Count reliably at least 20 objects, recognising that when rearranged the number of objects stays the same, estimate a number of objects that can be checked by counting - Compare and order numbers using the related vocabulary, use the =sign -Read, write and order numbers from 0-20; & then beyond; use place value to position numbers on no track or no line. -Say the no that is 1 more or less than any given no & 10 more or less for x 10 Knowing and using number facts -Derive and recall all pairs of numbers with a total of 10 & + facts for totals to at least 5; work out corresponding - facts -Count on and back in 1s, 2s, 5s and 10s & use this knowledge to derive multiples of 2, 5, 10 to x 10 -Recall the doubles of all no's to at least 10 Calculating -Relate addition to counting on; recognise that addition can be done in any order, use practical and informal written methods to support the addition of a 1-digit no or a multiple of 10 to a 1-digit or 2-digit no. -Understand subtraction as 'take away' and find a 'difference' by counting up; use practical and informal written methods to support the addition of a 1-digit no or a multiple of 10 to a 1-digit or 2-digit no. - Solve practical problems that involve combining groups of 2,5,10 or sharing into equal groups -Use vocab related to +/- and symbols to describe & record +/- no sentences. Using and applying mathematics - **S**olve problems involving +/- doubling or halving in different contexts.	**Strategies/knowledge** Recording for a purpose. Beginning to use symbols +, = and numbers to record number sentences. Use knowledge that addition can be done in any order. Put larger number first in order to count on. Put number in head and count on Add pairs with a total of 10 Begin to partition and recombine by breaking units of 6, 7, 8, 9 into 5 and a bit e.g. work out mentally that $5+8 = 5 + (5 \text{ and } 3)$ $= 5 + 5 + 3$ $= 10 + 3$ $= 13$ Identifying near doubles **Recording** Empty box with numbers as above Adding 3 digits e.g. $3 + 4 + 2 = \square$ $3p + \square + 1p = 8p$ Using a completed number line or track to count on Using empty number line to count on. Addition and subtraction facts to 10 and then 20.	**Strategies/knowledge** Recording and using signs – and = Number line 0-30 Encourage recording on number line. Put number in head and count back. Count back from the largest number. Count on to find the difference **Recording** Symbolic representations: How many less? Leading to empty box as above with numerals Ensure understand they put the largest number to subtract/take away. $10 - 3 = \square$ $10 - \square = 6$ Using a completed number line (or number track) to count back $7-3 = 4$ $8 – 3 = 5$ Addition and subtraction facts to 10 and then 20.	**Strategies/knowledge** Counting in 2s, 10s and 5s Doubling of numbers to 10 Repeated addition Recognise odd and even numbers. Rhymes and stories which involve counting in 2s or 5s. Use of money counting in 2ps, 5ps, 10ps. **Recording** Initially pictorially $2 + 2 + 2 + 2 = 8$ $2 \times 4 = 8$ 4 groups of 2 = 8 2 multiplied four times 2 groups of 3: using story sentences e.g. 2 bags with 3 apples each, practical activities column x row Number tracks & lines. Grouping objects pictorially	**Strategies/knowledge** Halving of numbers to 10. Counting patterns and equal groups. Repeated subtraction. Counting forwards and backwards in different intervals. **Recording** How many groups of 2 in 6? •• •• •• = 3 Recording pictorially using concrete objects. Partitioning sets

Progression in calculation – Use models and images; counting on and back in ones and tens; ordering numbers to 100; partitioning and recombining; addition and subtraction facts to 20; understanding addition and subtraction; understanding multiplication and division

Year Group -Two	Addition	Subtraction	Multiplication	Division
PRIMARY FRAMEWORK OBJECTIVES: Counting and understanding number - **R**ead and write 2-3 digit no's in figures & words; describe and extend no sequences and recognise odd & even nos. - **C**ount up to 100 objects by grouping them and counting 10s, 5s or 2s, explain what **each** digit in a 2-digit no represents, including no's where 0 is a place holder, partition 2-digit no's in dif ways, inc. into multiples of 10/1 - Order 2-digit no's & position them on a no line; use > / < signs - Estimate a no of objects & round 2-digit no's to the nearest 10 **Knowing and using number facts** - Derive & recall all + & - facts for each no to at least 10, all pairs with totals to 20 & all pairs of multiples of 10 with totals up to 100 - Understand halving is inverse of doubling & derive & recall doubles of all no's to 20 & corresp. halves - Derive & recall x facts for the 2,5,10 tables & related division facts, recog multiples of 2,5,10 at least 100; - Use knowledge of number facts and operations to estimate and check calculations Calculating - +/- mentally a single digit no or a multiple of 10 to or from any 2-digit no, use practical & informal written methods to +/- 2 digit nos. - Understand that – is the inverse of + & vice versa & use this to derive & record related +/- no sentences. - Use the symbols +/-/x/÷ & = to record & interpret no sentences involving all 4 ops, calculate the value of an unknown in a no sentence e.g. 30 - □ = 24 , □ ÷ 2 = 6 - Represent repeated + & arrays as x & sharing & repeated - (grouping) as ÷ ; use practical & informal methods & related vocab to support x & ÷, inc calcs with remainders **Using and Applying mathematics** - **S**olve problems involving +/-/x/÷ in dif contexts.	**Strategies/knowledge** Range: Nos. 0-100 Adding several numbers Addition bonds for all numbers to 10 then 100 Largest number first. Focus on place value. Partition into 100s, 10s and units Draw own number line Add 3 numbers by using strategies such as: look for pairs that make 10, start with largest number. Work out mentally questions like: 2 + 7 + 4 = 1 + 9 + 5 = Identify near doubles by using doubles already known e.g. 40+39 = (double 40 take away 1) Recognise symbol such as Δ to stand for unknown number **Recording** Adding 9 by adding 10 & adjusting Solve number problems using conventional signs and symbols Develop children's own recording in the context of practical work and explaining how problems were solved Using a number line or number grid to count on in 1s or 10s (or in head) 46+3 = 49 46+10 	**Strategies/knowledge** Range: Nos. 0-100 use number line Take away Subtract Difference between How many more? Find a small difference by counting up Subtract 2, 2 digit numbers Subtract 'teens' numbers from 2 digit number **Recording** Empty number box problems 10 – 7 = □ 10 - □ = 3 Subtract 9 by subtracting 10 and adjusting leading to subtract 19 Partition numbers into tens and units on a blank number line 28 – 17 = 11 Use an empty number line to count on/back to find the difference. 28 – 17 = 11 	**Strategies/knowledge** Counting in 2s,3s, 5s, 10s Doubles Understand as repeated addition Times/multiply Use 'x' sign in number sentences **Recording** Introduce arrays as a form of recording Number in column times number in row 6 x 3 = c x r • • • • • • • • • • • • • • • • • • 3 x 6 = c x r • • • • • • • • • • • • • • • • • • Multiplication as repeated addition using blank number line 6 x 3 = 18 	**Strategies/knowledge** Understand ÷ as sharing equally Understand ÷ as grouping Use ÷ sign in number sentences **Recording** Sharing 12 sweets between 4 How many do each have12? ooo ooo ooo ooo Division as grouping How many 4s make 12 (using blank number line) 12 ÷ 4 = 3

Progression in calculation – Use models and images; counting on and back in ones and tens; ordering numbers to 100; partitioning and recombining; addition and subtraction facts to 20; understanding addition and subtraction; understanding multiplication and division
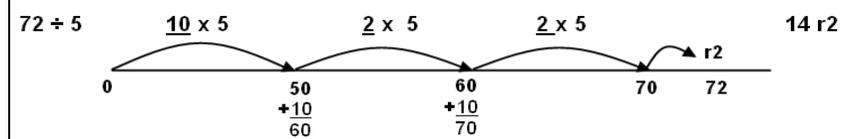
Year Group - THREE	Addition	Subtraction	Multiplication	Division

PRIMARY FRAMEWORK OBJECTIVES:
 	
Counting and understanding number
- Read write & order whole numbers to at least 1000 & position them on a no line; count on & back to 0 in single-digit steps or multiples of 10.
- Partition 3-digit numbers into multiples of 100, 10 & 1 in different ways
- Round 2 or 3 digit no's to the nearest 10 or 100 & give estimates for their sums & differences.
 	
Knowing and using number facts
- Derive & recall all +/- facts for each no to 20, sums & differences of multiples of 10 & pairs that total 100
- Derive & recall x facts for 2-6 & 10 & corresponding ÷ facts, recognise x of 2,5 or 10 up to 1000
- Use knowledge of no ops & corresponding inverses, including doubling & halving to estimate & check
 	
Calculating
- +/- mentally combinations of 1-digit & 2-digit numbers
- Develop & use written methods to record, support or explain +/- of 2 & 3 digit numbers
-Multiply one & two digit numbers by 10 or 100 & describe effect
- Use practical & informal written methods to support x/÷ of 2-digit, round remainders up or down
- understand that ÷ reverses x & vice versa & use to derive & record related x & ÷ no sentences
 	
Using and Applying mathematics
- Solve 1 & 2 step problems in a variety of contexts choosing appropriate calculations including communicating and reasoning.
	Strategies/knowledge
	Put largest number first
	Add several numbers
	Place value for 2, 3, and 4 digit numbers
	Partition and recombine (into 5 and a bit when adding 6,7,8 or 9)
	Identify near doubles
	Bridge through multiples of 10 and adjust
	Recognise addition as the inverse of subtraction.
	Recording
	Empty number boxes with missing numbers in all three positions e.g.
	34 + 5 = ☐
	34 + ☐ = 39
	☐ + 5 = 39
	partition into tens and ones and recombine on number line
	36 + 53 = 53 + 30 + 6
	
	+30 +6
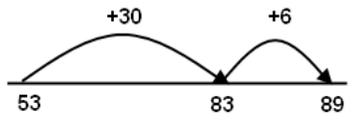	
	53 83 89
		Strategies/knowledge
		Add and subtract mentally a near multiple of 10 to or from a two digit number
		i.e. 284 -9 = 275
		284 – 10 + 1
		Recognise that when 2 numbers are close together it is easier to count up to find the difference.
		
		Recording
		Using an empty number line to count on or back to subtract.
		
		Counting back; partition the second number to support counting back in stages
		
		74 – 27 = 47
		74 – (20 + 4 + 3)
		
		-3 -4 -20
		
		47 50 54 74
		
		(counting on)
		
		+3 +40 +4
		
		27 30 70 74
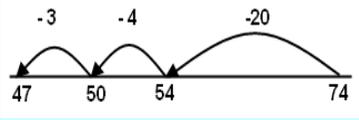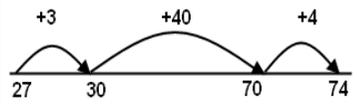		
		Complementary addition
		754
		 86
		   4 to make 90
		  10 to make 100
		 600 to make 700
		  50 to make 750
		   4 to make 754
		 668
			Strategies/knowledge
			Use knowledge of no facts and place value to x/÷ by 2 3, 4, 5, 6, 10.
			Use doubling and halving
			Multiplication can be done in any order
			Recognise as inverse of division.
			As scaling up getting X times bigger
			
			Recording
			Continue to use arrays as a form or recording
			6 x 3 =
			• • • • • •
			• • • • • •
			• • • • • •
			
			Multiplication as repeated addition (using blank number line)
			
			6 x 3 = 18
			
			1 2 3 4 5 6
			
			0 3 6 9 12 15 18
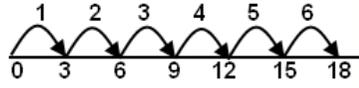			
			Introduce partitioning when ready to introduce TU x U
			Eg 13 x 3 = 10 x 3 + 3 x 3
				Strategies/knowledge
				Introduce remainders
				Recognition of sign
				Understand as sharing or grouping
				Recognise as inverse of multiplication
				Recording
				Division grouping (using a blank number line)
				Counting up on number line
				
				18 ÷3 = 6
				
				1 2 3 4 5 6
				
				0 3 6 9 12 15 18
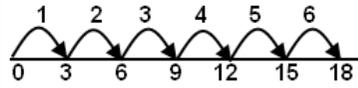				
				or sharing 18 shared between 3
				
				18÷ 3 = • • •
				              • • •
				              • • •
				              • • •
				              • • •
				              • • •
				
				Finding remainders after division
				
				1 2 3
				
				0 5 10 15 16
				
				16÷ 5 = 3r1

Progression in written calculations

Year Group - FOUR	Addition	Subtraction	Multiplication	Division
PRIMARY FRAMEWORK OBJECTIVES: Counting and understanding number - Partition, round & order 4 digit whole numbers; use positive & negative numbers in context & position on a no line; state inequalities using the symbols < > Knowing and using number facts - Use knowledge of +/- facts & place value to derive sums/differences of pairs of multiples of 10,100, 1000 - Identify the doubles of 2-digit numbers use to calculate doubles of multiples of 10 & 100 & derive the corresponding halves. -Derive & recall x facts up to 10 x 10, the corresponding ÷ facts & multiples of numbers to 10 up to the tenth multiple. - Use knowledge of rounding, number operations & inverses to estimate & check calculations. Calculating - +/- mentally pairs of 2-digit whole no's - Refine & use efficient written methods & subtract 2 & 3 digit whole numbers & £p - x / ÷ numbers up to 1000 by 10 & then 100 (whole no answers) understanding the effect; (relate to scaling up or down) - Develop & use written methods to record, support & explain x / ÷ of 2-digit numbers by a 1-digit no, including ÷ with remainders - Use a calculator to carry out 1 & 2 step calcs involving all 4 operations; recog negative no's in the display, correct mistaken entries/ interpret the display correctly in the context of money. Using and Applying mathematics - Solve 1 & 2 step problems in a variety of contexts, choose & carry out appropriate calculations using calculator methods where appropriate –problems to involve communicating and reasoning skills.	**Strategies/knowledge** Partitioning into hundreds, tens and ones Use & adjust near doubles **Recording** Continue work from Y3 using empty number lines 625 + 48 When ready move to expanded written methods Know how to set out in columns Adding **least** significant numbers preparing for 'carrying' above the line. Add several numbers with different numbers of digits Extend to decimals-Summer Term if ready	**Strategies/knowledge** Know that subtraction is NOT commutative. Continuing work in Y3 using empty number lines. (counting on) Encourage estimating the answer first **Recording** Expanded method leading to adjusting **Only when ready:** Continue to use mental methods with jottings where appropriate e.g. 1009 - 998 Share the knowledge that multiple subtractions need to be carried in steps	**Strategies/knowledge** Know by heart multiplication all multiplication facts up to 10 x10, including multiplication by 0 and 1 Multiply a multiple of 100 by 10 e.g. 600 x 10 = 6000 by shifting digits Derive corresponding division facts Derive quickly related facts for doubling and halving. Multiply any 2-digit number by 10 then 100 Approximate first e.g. 23 x 8 is approximately 20 x 10 = 200 **Recording** Partitioning using distributive law 47 x 5 = (40 x 5) + (7 x 5) Grid method TU x U 23 x 8 | x	**20**	**3**
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8	160	24	 160 + 24 = 184	**Strategies/knowledge** Using tables facts Divide a multiple of 100 by 10 e.g. 600 ÷ 10 = 60 by moving shifting digits Use repeated halving e.g. 60 ÷ 4 60 ÷ 2 = 30 30 ÷ 2 = 15 **Recording** • Identifying useful multiples 1, 2, 5, 10,20, 50, 100 • Using multiples of the divisor (chunking) • Largest possible 'chunk' subtracted first **Or recorded on a number line (see below)** Give remainder as a whole number Know whether to round up or down.

Useful multiples:

10 x 5 = 50
2 x 5 = 10

Progression in calculation

Year Group - FIVE	Addition	Subtraction	Multiplication	Division

PRIMARY FRAMEWORK OBJECTIVES:
 	
Counting and understanding number
-explain what each digit represents in whole numbers & decimals with up to 2 places & partition round and order these numbers.
 	
Knowing and using number facts
- Use knowledge of place value & addition & subtraction of 2-digit no's to derive sum & differences, doubles & halves of decimals.
- Recall quickly x facts up to 10 x 10 use to multiply pairs of multiples of 10 & 100 & derive quickly corresponding ÷ facts
- use knowledge of rounding, place value, No. facts & inverse ops to estimate & check calcs.
 	
Calculating
- Extend mental methods for whole no. calcs e.g. to multiply a 2-digit by 1-digit no 12 x 9
- Use efficient written methods to +/- whole numbers & decimals with up to 2 places.
- Use understanding of place value to x & ÷ whole numbers & decimals by 10,100 & 1000
- Refine & use efficient written methods to x & ÷ HTU x U, TU x TU, U.t x U & HTU ÷ U
- Use calculator to solve problems inc decimals & fractions e.g. find ¾ of 150g; interpret the display correctly in context of measurement.
 	
Using and Applying mathematics
- Solve 1 & 2 step problems involving whole numbers & decimals & all 4 ops, choosing & using appropriate calc strategies, inc calculator use.
- Represent a puzzle or problem by identifying & recording the calculations needed to solve it, find possible solutions & confirm them in the context of the problem.
	Strategies/knowledge
	Use empty number lines as for Y3 & 4
	Recognise when a written or mental strategy (with or without jottings) is more efficient
	Recording
	Expanded method but start with <u>least</u> significant numbers first in order to lead to 'carrying' above the line
	
	587
	+475
	12 7 + 5
	150 80 + 70
	900 500 + 400
	1062
	
	Only when ready move to standard method:
	
	587
	+ 475
	1062
	1 1
	
	Work with at least 2 digits
	Add several numbers
	Beginning with partitioning:
	Add 2 or more decimal fractions
	Know how to line up decimal points.
		Strategies/knowledge
		Use empty number line as for Y3 & 4
		Recognise when a written or mental strategy (with or without jottings) is more efficient
		Recording
		Expanded subtraction lining up digits
		
		754 – 286
		
		H T U
		600 140 14
		700 50 4
		- 200 80 6
		400 60 8
		
		Only when ready move to standard method:
		
		6 14 14
		754
		- 286
		468
		
		Subtract decimals using expanded method
		
		69.7 - 42.9
		T U tenths
		60 9 · 7
		- 40 2 · 9
		20 6 . 8 **26·8**
			Strategies/knowledge
			Know all multiplication tables
			Use mental calculations with jottings
			
			Using Partitioning:
			47 x 5 = (40x5) + (7x5)
			      = 200 + 35
			      = 235
			Recording
			Grid method
			HTU x U; TU x TU e.g.
			
			56 x 27
			
			| x
				50	6	

20	1000	120	1120
7	350	42	+ 392 | 1512 1 expanded short multiplication 346 X 8 48 8 x 6 320 8 x 40 2400 8 x 300 2768 **Only when ready** move to standard method for short multiplication using 'carrying' Extend to decimals with one decimal place	**Strategies/knowledge** Use corresponding division facts. Mental calculations with jottings. **Recording** • 'Chunking' using multiples of the divisor • Useful multiples • Explicit links to tables i.e. 6 x 7 (replaces 5 x 7 & 1 x 7) • Largest possible 'chunk' first HTU ÷ U 256 ÷ 7 = **36 R4** 256 - 140 (20 x 7) 116 - 70 (10 x 7) 46 - 42 (6 x 7) 4 Begin to give remainder as fraction or decimal where appropriate When ready move to expanded bus stop method 32 R 4 6)196 18 16 12 4 **only when ready** move on to 'bus shelter' method for short division 9 7 3 2 9²1

Useful multiples:

10 x 7 = 70
20 x 7 = 140
5 x 7 = 35

$256 \div 7$

| 20 x 7 | 10 x 7 | 6 x 7 | | 36 r4 |

0   140   210   252   256   r4

140   210
+ 70   + 42
210   252

Year Group - SIX	Addition	Subtraction	Multiplication	Division

PRIMARY FRAMEWORK OBJECTIVES:
 	
Counting and understanding number
- find the difference between a positive & a negative integer, or 2 negative integers in context.
 	
Knowing and using number facts
- Use knowledge of place value & x facts to 10 x 10 to derive related x & ÷ facts involving decimal no's e.g. 0.8 x
- Use knowledge of x facts to derive quickly squares of no's to 12 x 12 & corresponding squares of multiples of 10.
7, 4.8 ÷ 6
 	
Calculating
- Calculation mentally with whole no's & decimals e.g. U.t ± U.t, TU x U, Ut x U etc
- Use efficient written methods to +/- integers & decimals, to x & ÷ integers & decimals by a one-digit integer, & to multiply 2 & 3 digit integers by a 2-digit integer.
- Relate fractions to multiplication & division e.g. 6 ÷ 2 = ½ of 6 = 6 x ½
Express a quotient as a fraction or decimal e.g. 67 ÷ 5 = 13.4 or 13 2/5, find fractions & percentages of whole number quantities e.g. 5/8 of 96, 65% of £260.
- Use a calculator to solve problems involving multi-step calculations;
 	
Using and Applying mathematics
- Solve multi-step problems & problems involving communication and reasoning; choose & use appropriate calculation strategies at each stage inc calculation use.
	Strategies/knowledge
	
	Use empty number lines as for Y3, 4 and 5
	Continue to recognise when a written or mental strategy (with or without jottings) is more efficient
	
	Recording
	Use expanded addition as for Y5
	
	Use 'carrying' (continue to record as expanded addition).
	
	Decimals
	Add 2 or more with up to 4 digits and one or two decimal places
	e.g. 24.9 + 7.25
	
	24.90
	+ 7.25
	32.15
	 1 1
		Strategies/knowledge
		
		Use empty number lines as for Y3, 4 and 5
		Continue to recognise when a written or mental strategy (with or without jottings) is more efficient
		
		Recording
		Use expanded subtraction as for Y5
		
		Use decomposition (continue to record as expanded subtraction if necessary).
		Dealing with zeros when adjusting e.g.
		
		503 - 278
		
		  4 9 13
		5̶ 0̶ 3̶
		- 2 7 8
		  2 2 5
			Strategies/knowledge
			Mental calculations with jottings
			
			Using Partitioning:
			87 x 7 = (80 x 7)+(7 x 7)
			    =560 + 49
			    = 609
			Continue to approximate first
			
			Recording
			Use Grid method and short multiplication (continue to record as expanded short multiplication if necessary).
			
			Expanded long multiplication
			
			56
			x27
			42 (7 x 6)
			350 (7 x 50)
			120 (20 x 6)
			1000 (20 x 50)
			1512
			
			Only when ready move to standard method for long multiplication using 'carrying'.
			
			56
			x 27
			1120
			 392
			1512
			   1
			
			Extend to decimals with up to 2 decimal places
				Strategies/knowledge
				Mental calculations with jottings
				Continue to approximate first
				
				Recording
				• Useful multiples
				• Explicit links to tables
				• Efficient 'chunking' using multiples of the divisor
				HTU ÷ TU
				977 ÷ 36
				
				977
				- 360 (10 x 36)
				617
				- 360 (10 x 36)
				257
				- 180 (5 x 36)
				77
				- 72 (2 x 36)
				5
				
				Answer **27 r5**
				
				Extend to decimals up to two places
				Remainder rounding to 1 decimal place.
				Only when ready move to standard method for long division.

Useful facts:	$977 \div 36$

10 x 36 = 360
5 x 36 = 180
2 x 36 = 72

10 x 36   **10** x 36   **5** x 36   **2** x 36   r5   **27 r5**

0   360   720   900   972   977

```
  360        720       900
+ 360       +180      + 72
  720        900       972
```