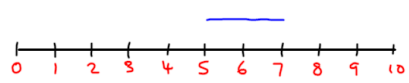
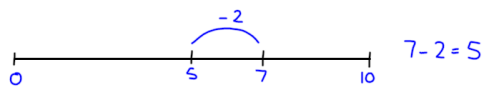
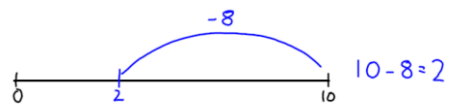
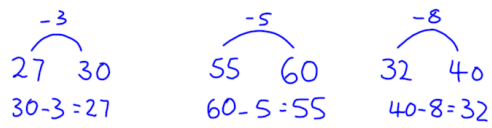
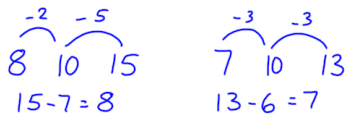
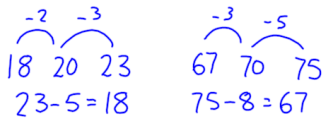
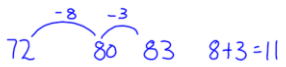
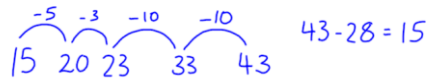
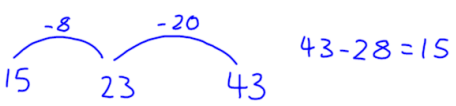
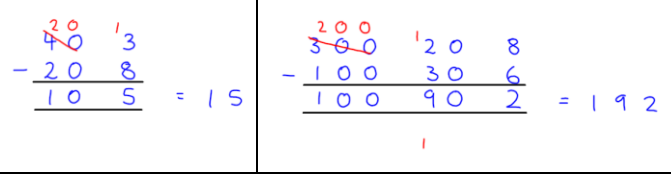
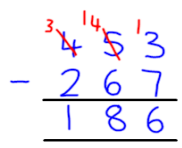
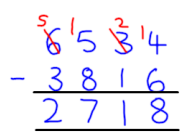
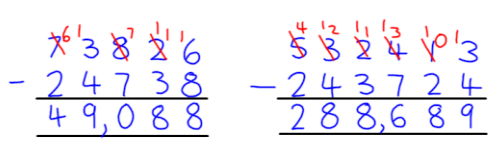
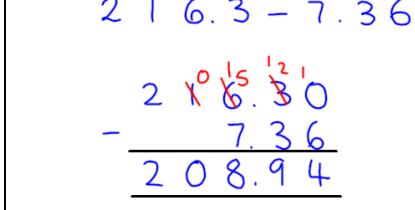
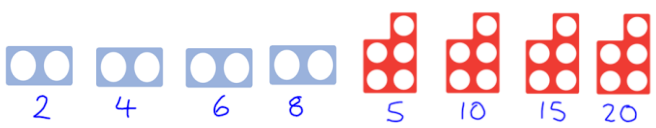
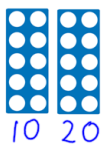
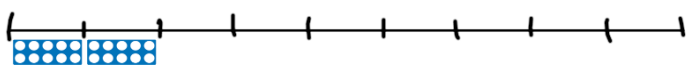
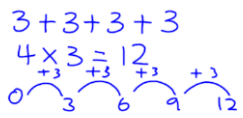
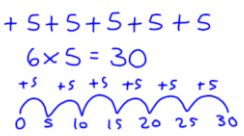
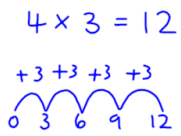
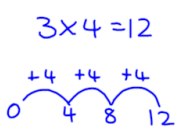
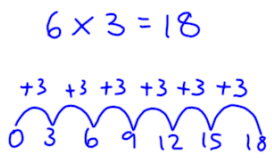
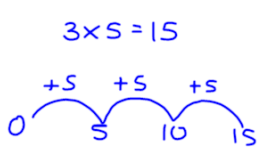
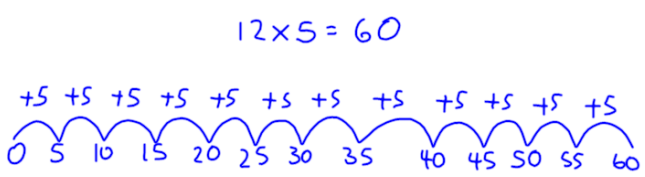
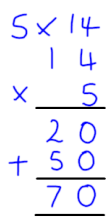
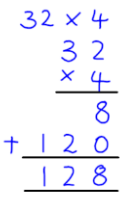
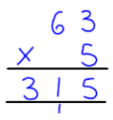
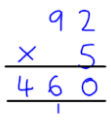
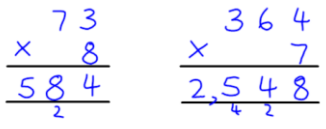
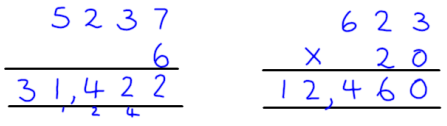
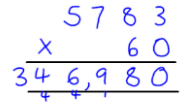
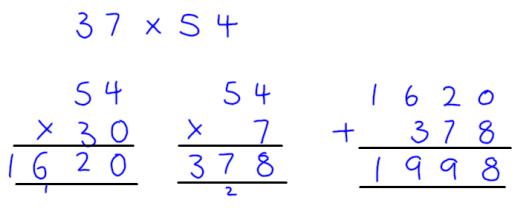
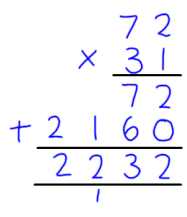
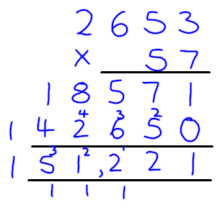
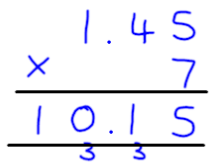
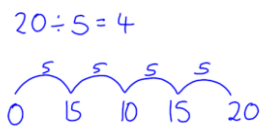
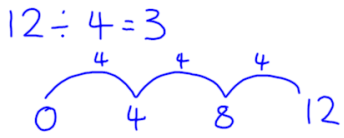
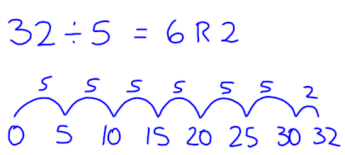
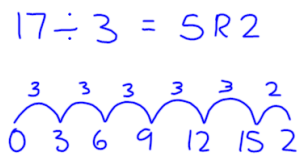
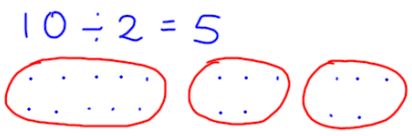
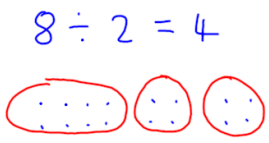
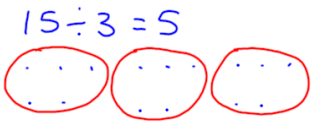
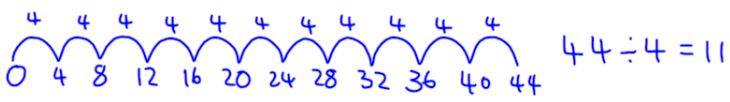
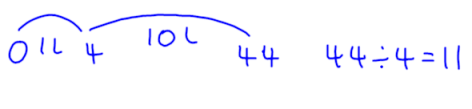
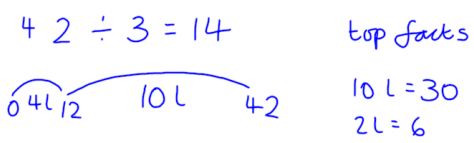
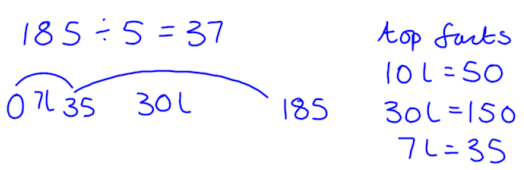
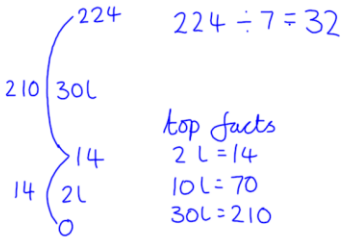
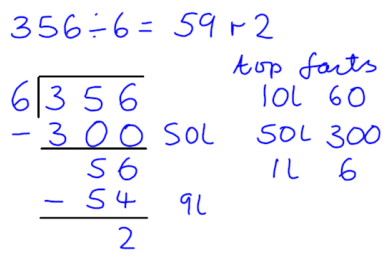
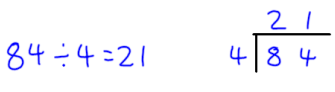
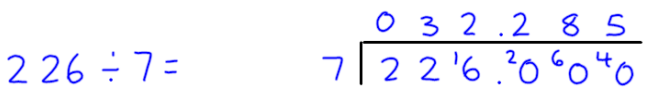
-	**William Barnes Primary School Written Calculation Policy 2016** **Subtraction**			
Year	Calculation	Numicon reference or calculation name		
R	3=3, 4=4	Kit 1 Calc 2B	Establish that = means "the same as" not "give me the answer"	Meaning of =
R	10 -2	Firm Foundations 12A		Children take away by hiding holes.
R	8-1, 7-1	Firm Foundations 12B		
R	4-3, 3-1	Firm Foundations 13A, 13B		
1	8-2, 7-3	Kit 1 Calc 3A	8 take away 2 equals 6 8 – 2 = 6 7 subtract 3 equals 4 7 – 3 = 4	Use words first then introduce symbols
1	7-2, 4-2	Kit 1 Calc 4B	 	At first give the children ready made number lines
1	7-0	Kit 1 Calc 6B	7-0=7 7-7=0	Role of zero in subtraction
1	Difference between 8 and 6 or 6 and 8 8-6=2	Kit 1 Calc 7A	8-2=6 The difference between 8 and 2 is 6.	Introducing the idea of difference early
1	10-1, 10-2, 10-3, 10-4, 10-5	Kit 1 Calc 7B Complement to 10		Children need to memorise complements to 10 as part of the 55 club
1	30-3 60-5 40-8	Kit 1 Calc 12B		Preparation for bridging 10 Children drawing their own number line jottings
1	15-7 13-6	Kit 1 Calc 13B Bridging 10		Bridging 10 – children apply their knowledge of number bonds learnt through the 55 club. Numbers less than 20.
2	23-5 75-8 93-6	Kit 2 Calc 8 Bridging 10		Bridging 10 – numbers less than 100.
2	What is the difference between 57 and 65? 65 - 57	Kit 2 Calc 8 Difference	What is the difference between 72 and 83? 	Revisit concept of difference with large numbers and bridging using counting back
2	43-28 62-34 96-38	Subtraction using number lines	 	Subtraction by counting back along the number line, in 10s then by multiples of 10
3	43-28 128-136 984-765 984-795			Develop expanded method to 3 digits. Dienes can be very useful for concrete work. (Numicon pieces take up too much space)
3	128-136 984-765 984-795			Start with one column requiring "borrowing", then extend to two columns requiring "borrowing".
4	6534-6537			"Starting with the units, the 4 isn't large enough to subtract six. We make it bigger by borrowing 10 from the tens column. The four becomes 14, whilst the thirty becomes twenty."
5	73,826-24,738 532,413-243,724 216.3-7.36		 	Children are fluent in their number bonds and are not troubled by the complexity of these calculations working fluently and with pace.

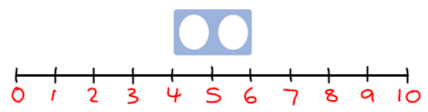
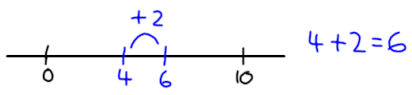
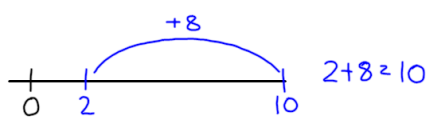
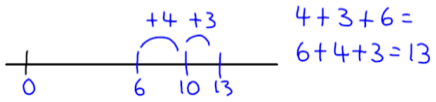
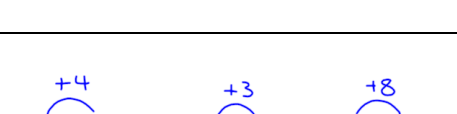
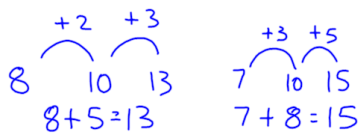
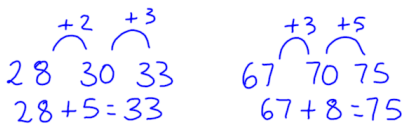
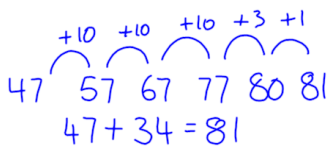
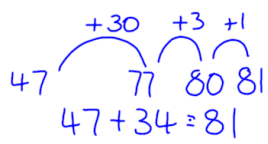
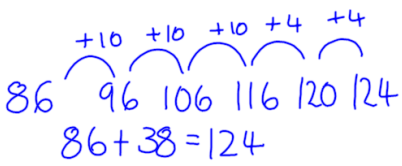
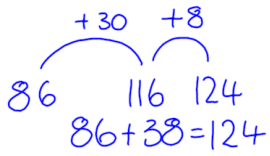
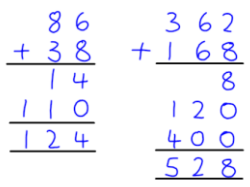
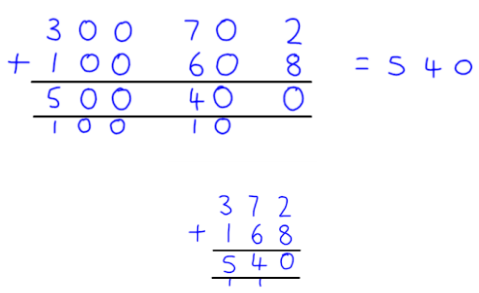
6			No new content in Year 6 for subtraction	

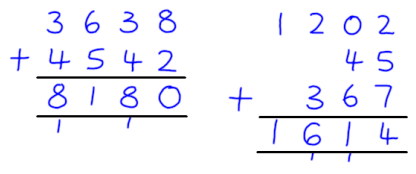
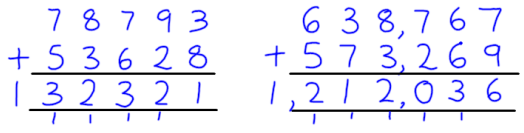
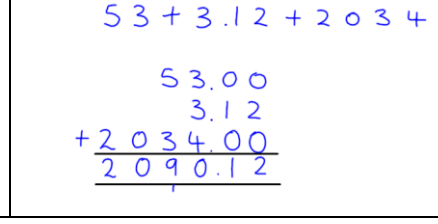
x	William Barnes Primary School Written Calculation Policy 2016 Multiplication			
Year	Calculation	Numicon reference or calculation name	Progression in recording written calculations	Notes
R	Counting 1-10 in 1s 0-20 in 2s 0-100 in 10s 0-20 in 5s	No reference in Firm Foundations		Use objects as well as Numicon tiles
1	Counting in groups of 10 10,20,30 etc.	Kit 1 NANS 3B	 	No recording at this point
1	Extend number sequences	Kit 1 Pattern 5B		Also see Kit 1 NANS 5 Kit 2 Pattern 7 for relevant experience
2	4x2, 3x5 4x3, 2x7	Kit 2 Calc 12		Kit 2 Calculation 11 – practical introduction – no recording
2	3+3+3+3+3 5x3 10+10+10 3 x 10	Kit 2 Calc 13	 	Use number tracks and rods – then use number line jottings
2	3 x 4 = 4 x 3	Kit 2 Calc 14	 	Kit 2 Calc 15 focusses on doubles and multiplying by 1 Although Numicon does not use these, record with number ines
2	3,4,5 times table	Kit 2 Calc 16	 	Use number lines to record practical work.
2	12 x 5 14 x 3	Final numberline stage		Number lines reaching their limit and becoming too cumbersome.
3	5 x 14 4 x 32	Short multiplication expanded	 	Introduce column multiplication with an expanded method. The addition part should be completed mentally starting with the largest number.
3	5 x 63	Short multiplication	 	Children record carrying. Please write carries under the answer box
4	8 x 73 7 x 364	Short multiplication		Extending method to hundreds and including all times tables.
5	6 x 5237 20 x 623 60 x 5783 37 x 54 57 x 2653	Short and long multiplication	    	Introduce multiplying by multiples of 10. Add a magic zero to move the answer up one column. Firstly, break up long multiplications into two products and then add the answers together. Then move to multiplying by 21, 31 etc. before full method

6	7 x 1.45	Short multiplication of a decimal		In year 6, the only new material is multiplying decimals by integers.

÷	William Barnes Primary School Written Calculation Policy 2016 Division				
Year	Calculation	Numicon reference or calculation name	Progression in recording written calculations		Notes
2	50÷10=5 20÷5=4 12÷4=3	Kit 2 Calc.17 Counting up strategy Kit 3 Calc. 7			Say "How many 10s in 50?" Number lines for less able – support with apparatus
2	32÷5=6R2 17÷3=5R2	Kit 2 Calc.18 Counting up strategy Kit 3 Calc.7			Say "How many 5s in 32?" Make sure practical work is recorded with number lines
	10÷2=5 8÷2=4	Kit 2 Calc.19 The sharing nature of division Kit 3. Calc 11			Don't record with number lines when sharing. Say "Divide 10 into two equal parts." Say "Divide 15 into 3 equal parts." Sharing inefficient when group sizes and numbers increase e.g 64÷4
2	15÷3=5 22÷4=5R2	Kit 2 Calc.20 Kit 3 Calc.11			Once children understand sharing, focus on counting up or repeated addition e.g "How many 4s in 44?" Once children secure with number line move onto short multiplication.
3	44÷4=11				Record using number lines – repeated subtraction
4	90÷8=11r2				Repeated subtraction on number line – first step for chunking
4	42÷3=14 185÷5=37				Moving to larger chunks Write down "top facts"at the start . Record as l for "lots" to avoid using the multiplication sign.
5	224÷7=32 356÷6=59r2				Move to vertical number line then begin recording as column method. This is preparation for dividing by 2 digit numbers.
5	84÷4=21 165÷5=33				Short division or "bus stop" method. Use when dividing by single digit
5	226÷7=32.285 3444÷8=430.5				Useful when dealing with remainders.
5	295.4÷7=42.2 183÷9=20.333				Useful for exploring recurring decimals.

6	390÷32=12r6 4152÷22=816		390 ÷ 32 = 12 R 6 32 | 390 − 320 (10L) = 070 − 64 (2L) = 06 top facts: 1L 32, 2L 64, 10L 320	9,152 ÷ 22 = 816 22 | 9152 − 8800 (800L) = 0352 − 330 (15L) = 022 − 22 (1L) = 00 top facts: 10L 220, 20L 440, 40L 880, 800L 8800, 5L 110, 15L 330	Use chunking method when dividing by a 2 digit number.

+	William Barnes Primary School Written Calculation Policy 2016 Addition				
Year	Calculation	Numicon reference or calculation	Progression in recording written calculations		Notes
R		Firm Foundation 10a, 10b, 11a, 11b			Children choose two tiles and decide which tile is the same introducing addition.
1	6+2, 6+3, 6+4,6+5,6+6 etc	Kit 1 Calc 4A			Extend to adding 3,4,5 etc First use of number lines
1	5+0, 8+0	Kit 1 Calc 6A			Adding zero – crucial concept
1	1+9, 2+8, 3+7, 4+6, 5+5, 6+4, 7+3, 8+2, 9+1	Kit 1 Calc 7B			Children memorise their complements to ten as part of their 55 club
1	4+3+6	Kit 1 Calc 9A Adding 3 numbers using complements			Commutative law of addition Children find pairs are complements to 10 before adding.
1	37 + ? = 40 72 + ? = 80	Kit 1 Calc 12A			Adding to nearest 10 prepares the children for bridging 10.
1	8+5 = 13 7+8 = 15	Kit 1 Calc 13 A Bridging 10			Bridging 10 < 20 to begin with.
2	28+5 = 33 67+8 = 75	Kit 2 Calc 7 Bridging 10			Use apparatus including Numicon and Numicon IWB software to model
2	47+34 = 81				Bridging numbers approaching 100
2	86+38 = 124				Exceeding 100 Children now need to move to column methods
3	86+38 362+168				Add the numbers mentally starting with largest number E.g. 400 + 120 + 8 = 520 + 8 = 528
	372+168	Expanded column method Contracted column method			Always start with the units first Once children understand idea of carrying then move onto compact method Carrying always below the answer box

4	3638+4542 1202 + 45 + 367	Contracted column method			Introduce numbers with different numbers of digits. Add three or more numbers in columns.
5	78793+53628 53+3.12+2034	Contracted column method			Extending to adding 5 digit numbers Then six and digit numbers Adding numbers with different numbers of digits and decimal places
6			No new content in Year 6 for addition		

Adopted date:	**28/07/20**
Signature of Headteacher:	**Karen Wrixon**
Signature of Governing body:	**C Walters**
Next review date	**Spring 2022**