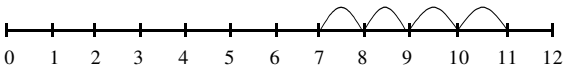
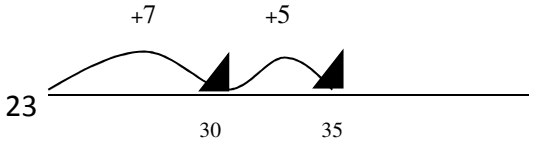
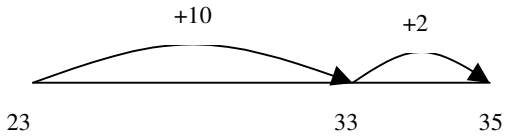
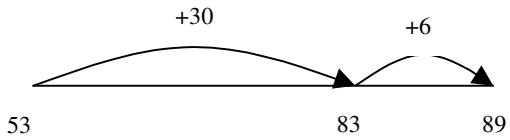
Burchetts Green CE Infant School
Written Calculation Policy
Pencil and paper procedures
EYFS and Key Stage 1

Written calculation objectives 2015

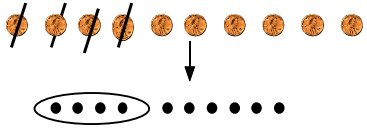
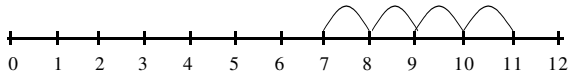
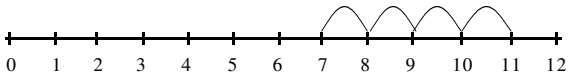
Addition		
Year 1	**Year 2**	**Year 3**
LO - To relate addition to counting on. LO - To recognise that addition can be done in any order. LO: To use practical and informal written methods to support the addition of a one-digit number or a multiple of 10 to a one-digit or two-digit number.	LO: To use practical and informal written methods to add two-digit numbers. G&T– To develop and use written methods to record, support or explain addition of two-digit and three-digit numbers.	

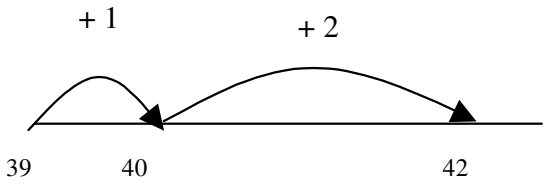
Addition		
Year 1	Year 2	Year 3
Equations **+ = signs and missing numbers** 3 + 4 = = 3 + 4 3 + = 7 7 = + 4 + 4 = 7 7 = 3 + + ∇ = 7 7 = + ∇ Promoting covering up of operations and numbers. **Process/written method** **Number lines (numbered)** 7 + 4  Recording by - drawing jumps on prepared lines Progress to constructing own number lines (Teacher model number lines with missing numbers)	**Equations** **+ = signs and missing numbers** Continue using a range of equations as in Year 1 but with appropriate, larger numbers. Extend to 14 + 5 = 10 + and adding three numbers 32 + + = 100 35 = 1 + + 5 **Process/written method** **Number lines (not numbered)** To the nearest 10 23 + 12  Partitioning and jumping 10s 23 + 12  **Partition into tens and units and recombine** 12 + 23 = 10 + 2	

(Teachers model jottings appropriate for larger numbers)	20 + 3 30 + 5 = 35 **G&T Equations** **+ = signs and missing numbers** Continue using a range of equations as in Year 1 and 2 but with appropriate, larger numbers. **Process/written method** **Number lines (not numbered)**  **Partition into tens and units and recombine** 83 + 42 = 80 + 3 40 + 2 120 + 5 = 125

Written calculation objectives 2015

Subtraction		
Year 1	**Year 2**	**Year 3**
LO: To use practical and informal written methods to subtract two-digit numbers (*not in Renewed Framework*).		LO: To use practical and informal written methods to subtract two-digit numbers. LO: Understand that subtraction is the inverse of addition and vice versa. G&T: To develop and use written methods to record, support subtraction of two-digit and three-digit numbers.

Subtraction	
Year 1	Year 2
Pictures / marks Sam spent 4p. What was his change from 10p?  **Equations** **- = signs and missing numbers** 7 - 3 = = 7 - 3 7 - = 4 4 = - 3 - 3 = 4 4 = 7 - - ∇ = 4 4 = - ∇ **Process/written method** **Number lines (numbered)** The **difference** between 7 and 11 (Counting up)  Recording by - drawing jumps on prepared lines - constructing own lines (Teachers model jottings appropriate for larger numbers)	**G&T Equations** **- = signs and missing numbers** Continue using a range of equations as in Year 1 but with appropriate numbers. Extend to 14 + 5 = 20 - **Process/written method** **Number lines (numbered)** The **difference** between 7 and 11 (Counting up)  Recording by - drawing jumps on prepared lines **Number lines (blank)** Complementary addition Find a small **difference** by counting up 42 – 39 = 3



G&T Equations

- = signs and missing numbers

Continue using a range of equations as in Year and 2 but with appropriate numbers.

Process/written method

Find a small difference by counting up

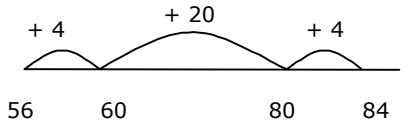
Continue as in Year 2 but with appropriate numbers

e.g. 102 – 97 = 5

Number lines (blank)

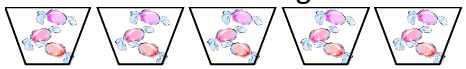
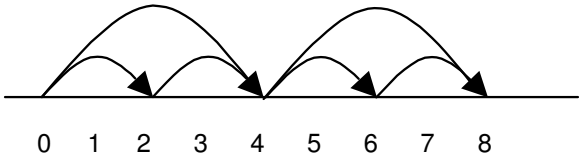
Complementary addition

Find the **difference** by counting up. Continue as in Year 2 but with appropriate numbers with larger differences, e.g. 84 – 56 = 28 *(bridging to the nearest multiple of 10).*



Written calculation objectives 2015

Multiplication		
Year 1	**Year 2**	**Year 3**
LO: To use practical and informal written methods to multiply two-digit numbers (*not in Renewed Framework*).		LO: To represent repeated addition as multiplication. LO: To represent arrays as multiplication. LO: To use practical and informal written methods to support multiplication, including calculations with remainders. LO: To use practical and informal written methods to multiply two-digit numbers (e.g. 13 × 3).

Multiplication	
Year 1	Year 2
Process/written method **Pictures and symbols** Grouping There are 3 sweets in one bag. How many sweets are there in 5 bags?  *(Recording on a number line modelled by the teacher when solving problems)*	**Equations** **x = signs and missing numbers** 7 x 2 = = 2 x 7 7 x = 14 14 = x 7 x 2 = 14 14 = 2 x x ∇ = 14 14 = x ∇ **Process/written method** **Arrays and repeated addition** ● ● ● ● 4 x 2 or 4 + 4 ● ● ● ● 2 x 4 or repeated addition on a number line 2 + 2 + 2 + 2  0 1 2 3 4 5 6 7 8 Partition (need to be able to partition to use grid method) 15 x 2 = 10 x 2 = 20 5 x 2 = 10 20 + 10 = 30 Grid method (more able)

x	10	5
2	20	10

G&T Equations

x = signs and missing numbers

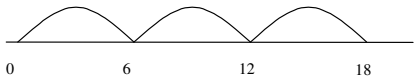
Continue using a range of equations as in Year 2 but with appropriate numbers.

Process/written method

Arrays and repeated addition

Continue to understand multiplication as repeated addition and continue to use arrays and number line (as in Year 2).

6 x 3



Progress from partitioning in Year 2 to the grid method

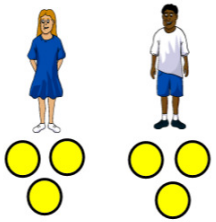
x	30	5
2	60	10

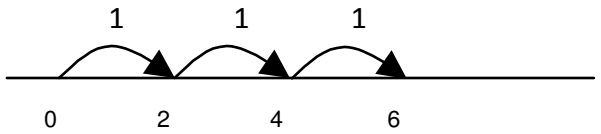
Use the same method as above (partitioning),
e.g. 32 x 3 = 96

x	30	2
3	90	6

Written calculation objectives 2015

Division	
Year 1	**Year 2**
LO: To use practical and informal written methods to divide two-digit numbers (*not in Renewed Framework*).	LO: To represent sharing and repeated subtraction (grouping) as division. LO: To use practical and informal written methods and related vocabulary to support division, including calculations with remainders. LO: To use practical and informal written methods to divide two-digit numbers (e.g. 50 ÷ 4).

Division	
Year 1	Year 2
Process/written method **Pictures / marks** **Grouping** 12 children get into teams of 4 to play a game. How many teams are there? 	**Equations** ÷ = signs and missing numbers 6 ÷ 2 = = 6 ÷ 2 6 ÷ = 3 3 = 6 ÷ ÷ 2 = 3 3 = ÷ 2 ÷ ∇ = 3 3 = ÷ ∇ **Process/written method** **Understand division as sharing and grouping** Sharing – 6 sweets are shared between 2 people. How many do they have each?  6 ÷ 2 can be modelled as: Grouping – There are 6 sweets. How many people can have 2 each? (How many 2's make 6?) Number line



More able division with Remainders.

Equations

÷ = signs and missing numbers

Continue using a range of equations as in Year 2 but with appropriate numbers.

Process/written method

Understand division as sharing and grouping

18 ÷ 3 can be modelled as:

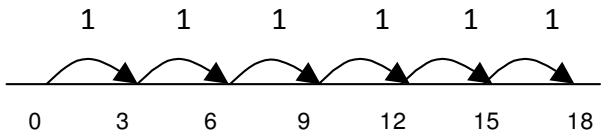
Sharing – 18 shared between 3 (see Year 2 diagram)

OR

Grouping - How many 3's make 18?

Number line

18 ÷ 3 = 6



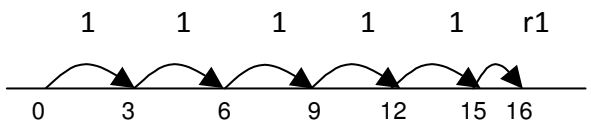
G&T Remainders

16 ÷ 3 = 5 r1

Sharing - 16 shared between 3, how many left over?

Grouping – How many 3's make 16, how many left over?

e.g.

	 1 1 1 1 1 r1 0 3 6 9 12 15 16