Berkeley Primary School Written Calculation Policy
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
1	What is double 2? Double 2 equals 4. 2 + 2 = 4	Double More	Mostly pictorial representations: Ladybird spots for doubling numbers to 10.  Counting pairs e.g. How many socks are there in two pairs?  	By the end of Reception, children are expected to understand the concept of doubling and to be able to double a number up to 10. Before doubling can be introduced, children need to have a secure knowledge of counting, number facts and addition in order to double. Children are then introduced to the concept of doubling through practical games and activities, including the use of the outdoor areas. Children act out 'doubling' by physically add two equal groups together to find out the 'doubles' answer. **Resources** A range of objects to count e.g. counters, small toys, buttons, cubes, pegs etc, Pairs of socks or gloves, fingers, songs	**Reception**

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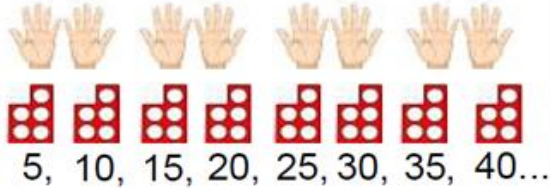
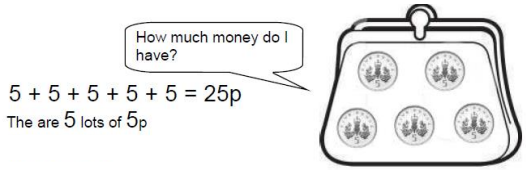
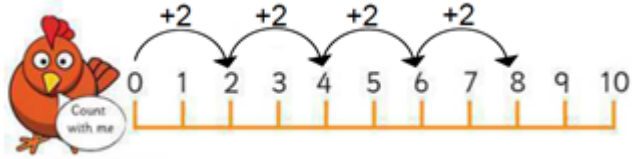
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
2	**There are 2 wheels on a bike and there are 5 bikes. How many wheels are there?** **There are 10 crayons in each box. How many are there altogether?**  *support problem solving and encourage the application of counting in steps of / repeated addition)*	ones groups groups of lots of doubling double counting on repeated addition times	**Use of concrete apparatus for the children to physically count and see.**  5+5+5+5+5+5+5+5 = 40  **Number tracks and number lines** can be used to add on and count in steps.   = 2+2+2=6	Children will develop some understanding of multiplication through grouping small quantities and repeated addition of small groups of numbers. They will then begin to count in steps of either 2, 5 or 10. The use of concrete objects will enable them to grasp this concept more quickly. The children will use number lines to count on in steps and will solve simple problems by using counting on / repeated addition. **Resources** A range of objects to count e.g. counters, small toys, buttons, cubes, pegs, coins etc, pairs of socks or gloves, number lines fingers, songs. Numicon, Dienes or place value counters to count in 10s.	BM Steps 1 - 4 **Year 1**

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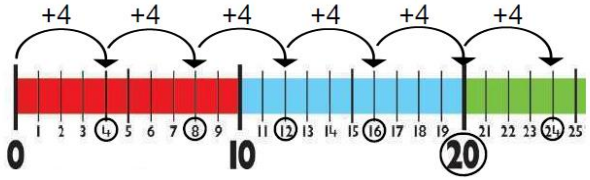
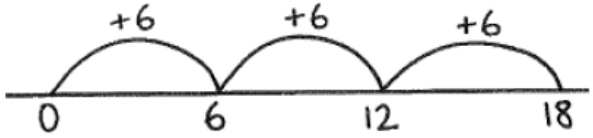
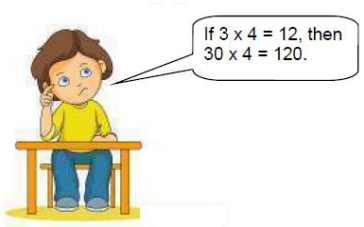
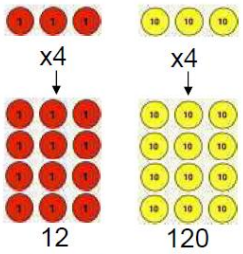
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
3	**I have 3 pairs of shoes – how many shoes do I have altogether?** **5 multiplied by 4 is …** **Which of these numbers are in the 5 times table?** **How do you know?** 72 45 53 80 69 95	Multiple Multiplication Tables facts Groups of Lots of Times Counting on Repeated addition	**Record multiplication calculations using x symbol; use objects, counting and repeated addition to solve.** e.g. 6 x 6 = 6 groups of 6 6+6+6+6+6+6=36 6 x 6 = 36 e.g. 6 x 4 = 6 lots of 4  4+4+4+4+4+4 = 24 6 x 4 = 24 **Recording as a pictorial representation:** e.g. 3 x 4 = X X X X X X X X X X X X = 4 + 4 + 4 = 12	At this stage the children will still be doing a lot of concrete work and may also still use pictorial representations but with values other than x2, x5 and x10. Again, their experience of 'multiplication' still has many connections to repeated addition. Children should begin to recall, from memory, multiplication facts for the 2, 5 and 10 times tables. **Resources** Counters, cubes, Numicon, coins, number lines	BM Steps 1 - 4 **Years 1 and 2**

Berkeley Primary School Written Calculation Policy
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
4	**I have four 20p coins. How much money have I got?** **Harry's sunflower is 9cm tall. Alex's is 4 times taller. How tall is Alex's sunflower?** **9 multiplied by 3.**	Multiple Multiplication Tables facts Groups of Lots of Times Counting on Repeated addition Array Row Column	**Recording as a pictorial representation – an array:** e.g. X X X X X X X X X X X X 6+6+6 = 3 x 6 = 18 X X X X X X 3+3+3+3+3+3 = 18 **Blank number lines** to count up: 3x6 = 6+6+6 = 18  To move on to the next stage children will need to develop their understanding of multiplying larger numbers:   Place value counters can be used to demonstrate this idea.  4 x 2 = 8 4 x 20 = 80	Children are moving away from the need for concrete apparatus and are able to use informal methods of recording (pictures, arrays and the number line) to solve multiplication calculations. **Resources** Number lines, number grids, place value counters.	BM Steps 5 – 8 **Years 2 and 3**

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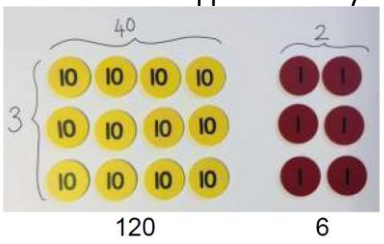
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
5	**What is double 16?** **What is the product of 25 and 6?** **Harry's sunflower is 89cm tall. Alex's is 3 times taller. How tall is Alex's sunflower?**	Lots of Groups of Times Multiplication Multiply Multiplied by, Multiple of twice, 3 times etc.. Repeated addition, Array Row Column Double Product Tables facts Partition Recombine	**Grid method** (TO x O) (partitioning): Use place value resources to support initially 42 x 3 = 126  to lead to: 42 x 3 = |	40	2
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3	120	6	 = 126 *Encourage children to make estimations first using rounding ie 40 x 3 = 120 so my answer will be slightly more than this.*	Children should use doubling strategies and place value facts to help multiply by 10 or 100. Calculations can be done with either least or most significant digit first) **Resources** Numicon, place value counters, Dienes, number lines, number grids, coins,	BM Steps 9 - 14 **Year 3 and 4**

Berkeley Primary School Written Calculation Policy
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
6	**What is the product of 125 and 4?** **Multiply 34 by 8.** **Calculate 345 x 9**	Lots of Groups of Times Multiplication Multiply Multiplied by, Multiple of Array Row Column Double Product Tables facts Partition Recombine Grid method … times as big, long etc	**Grid method** (HTO x O and TO x O). (Place value counters could still be used to support as above) e.g. 223 x 8 = 200 20 3 8 | 1600 | 160 | 24 | = 1600 + 160 24 1784 Leading to an expanded column method 223 x 8 24 *(8x3)* 160 *(8 x 20)* 1600 *(8 x 200)* 1784 *Children may find it helpful to record the calculations they are doing in order to keep track.*	Children use the same methods as above. However children should now use the least significant digit first (inline with addition policy). They should be carrying the following types of calculation: **TO x O** and **HTO x O**. **Resources** Dienes, place value counters.	BM Steps 9 – 15 **Year 4 and 5**

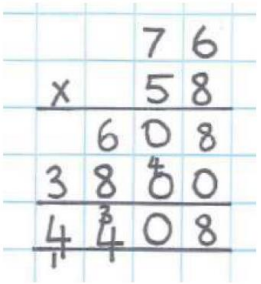
Berkeley Primary School Written Calculation Policy
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
7	**What is the product of 125 and 4?** **Multiply 34 by 8.** **Calculate 345 x 9**	Lots of Groups of Times Multiplication Multiply Multiplied by, Multiple of Array Row Column Double Product Tables facts Partition Recombine Grid method … times as big, long etc	Leading to **short multiplication** 223 x 8 1784 1 1 2 *Encourage children to make estimations first using rounding ie 200 x 8 = 1600 so my answer will be more than 1600.*	They should be carrying the following types of calculation: **TO x O** and **HTO x O**.	BM Steps 9 – 15 **Year 4 and 5**

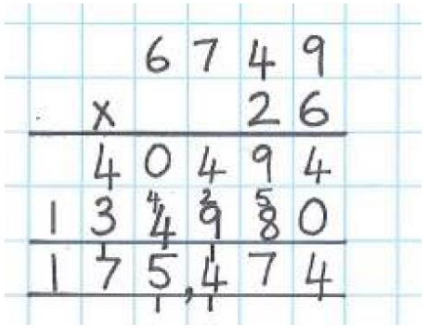
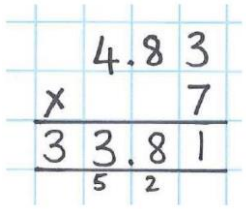
Berkeley Primary School Written Calculation Policy
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
8	**Double 75.** **What is the product of 125 and 4?** **Calculate 4346 x 9**	Lots of Groups of Times Multiplication Multiply Multiplied by, Multiple of Array Row Column Double Product Tables facts Partition Recombine Grid method … times as big, long etc Product Cubed Squared Scaling	**Short multiplication** – an extension to the above for ThHTO x O 3223 x 8 25784 1 1 2 *Encourage children to make estimations first ie 3000 x 8 = 24000 and 200 x 8 = 1600 so my answer will be approximately 25600.*	Children in Year 6 should use the methods as those in Year 5 continuing to use least significant digit first Children should be extended to working with **ThHT0 x O** and **T0 x T0** and **HTO x TO**. *Continue to develop skills in estimation.*	BM Steps 16 - 19 **Year 5 and 6**

Berkeley Primary School Written Calculation Policy
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
9	**Fill in the missing numbers to make these calculations true.** □ x □ = 864 □ x □ x □ = 864	Lots of Groups of Times Multiplication Multiply Multiplied by, Multiple of Array Row Column Double Product Tables facts Partition Recombine Grid method … times as big, long etc Product Cubed Squared Scaling	The **Grid method** and **Expanded method** e.g. 76 x 58 = 70 6 50 | 3500 | 300 | = 3800 8 | 560 | 48 | = 608 4408 76 x 58 48 *(8x6)* 560 *(8x70)* 300 *(50x6)* 3500 *(50x70)* 4408 1 1 Leading to: **Long Multiplication**:  *Encourage children to make estimations first ie 70 x 50 = 3500 and 80 x 60 = 4800 so my answer will lie between these.*	Calculations will involve HTO x TO; TO x TO	**Year 5 and 6**

Berkeley Primary School Written Calculation Policy
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
10		As Stage 9	**Long multiplication** – used consistently for the above and for larger numbers e.g. 6749 x 26 = 175474  	Continue to develop skills in estimation.	**Year 5 and 6**
11	**A 5p coin has a thickness of 1·7 mm.** **Ahmed makes a tower of 5p coins worth 40p.** **Write down the calculation you would use to find the height of the tower.**	As Stage 9	**Short multiplication** for decimals (The **grid method** could be used initially to reinforce place value) e.g. 4.83 x 7 = 4 0.8 0.03 7 | 28 | 5.6 | 0.21 = 28 5.6 0.21 33.81 1 Leading to:  	Extend these ideas to working with decimals. Multiply decimal numbers with up to 2 decimal places by a single digit number.	**Year 5 and 6**

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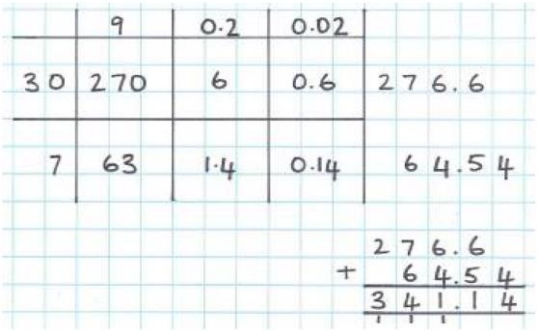
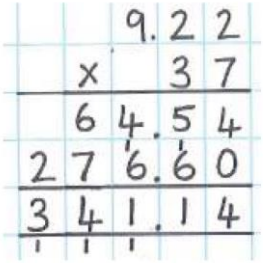
Multiplication

Stage	EXAMPLES	VOCABULARY	HOW IT WILL LOOK IN WRITTEN FORM	NOTES	Big Maths **NC 2014**
12		As Stage 9	**Long multiplication** for decimals (The **grid method** could be used initially to reinforce place value)   *Encourage children to make estimations first using rounding ie 9 x 30 = 270 and 9 x 40 = 360. My answer will lie in between these and will have two decimal places.*	Extend these ideas to working with decimals. Multiply decimal numbers with up to 2 decimal places by a single or two-digit number.	**Year 6**