

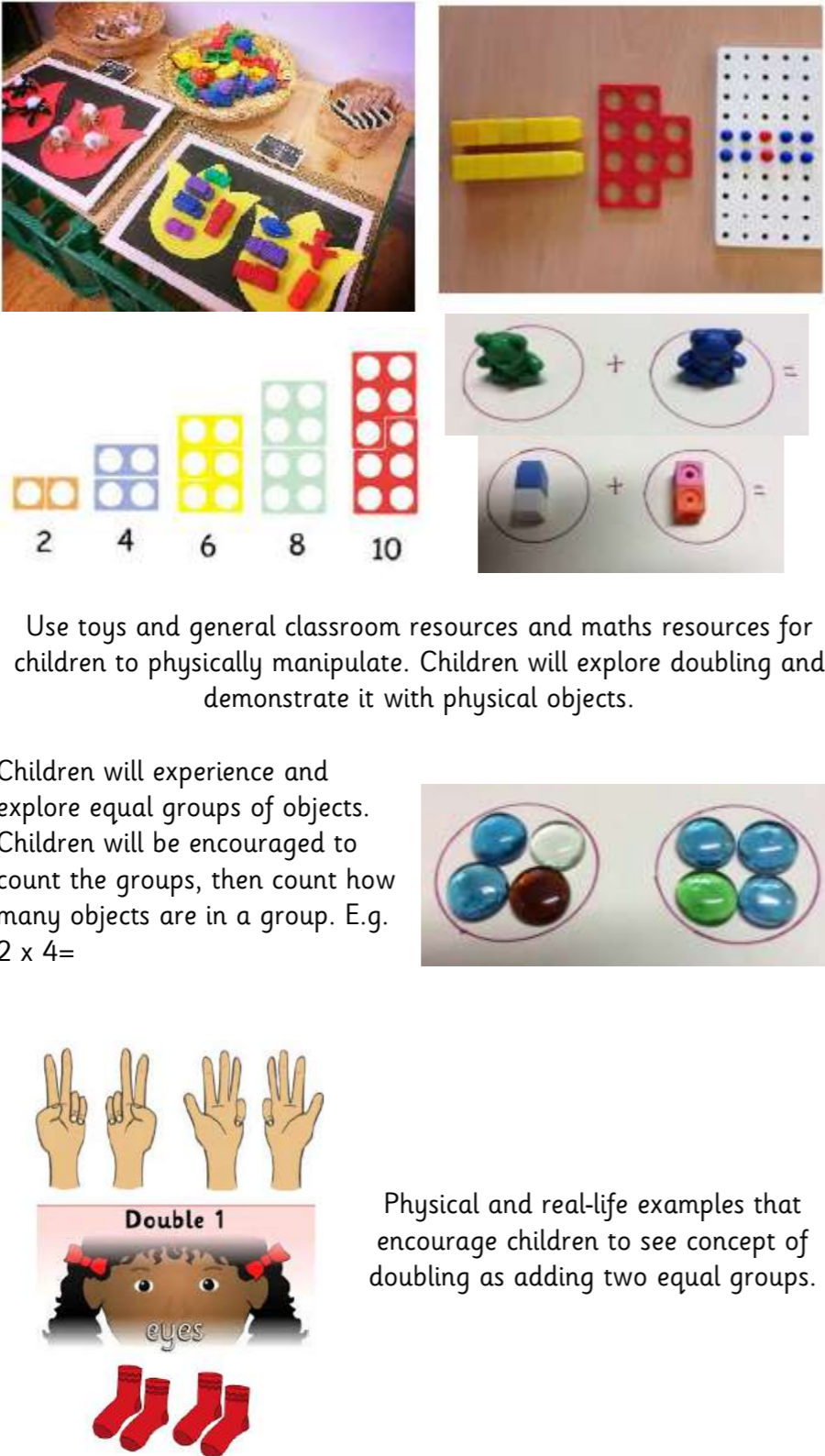
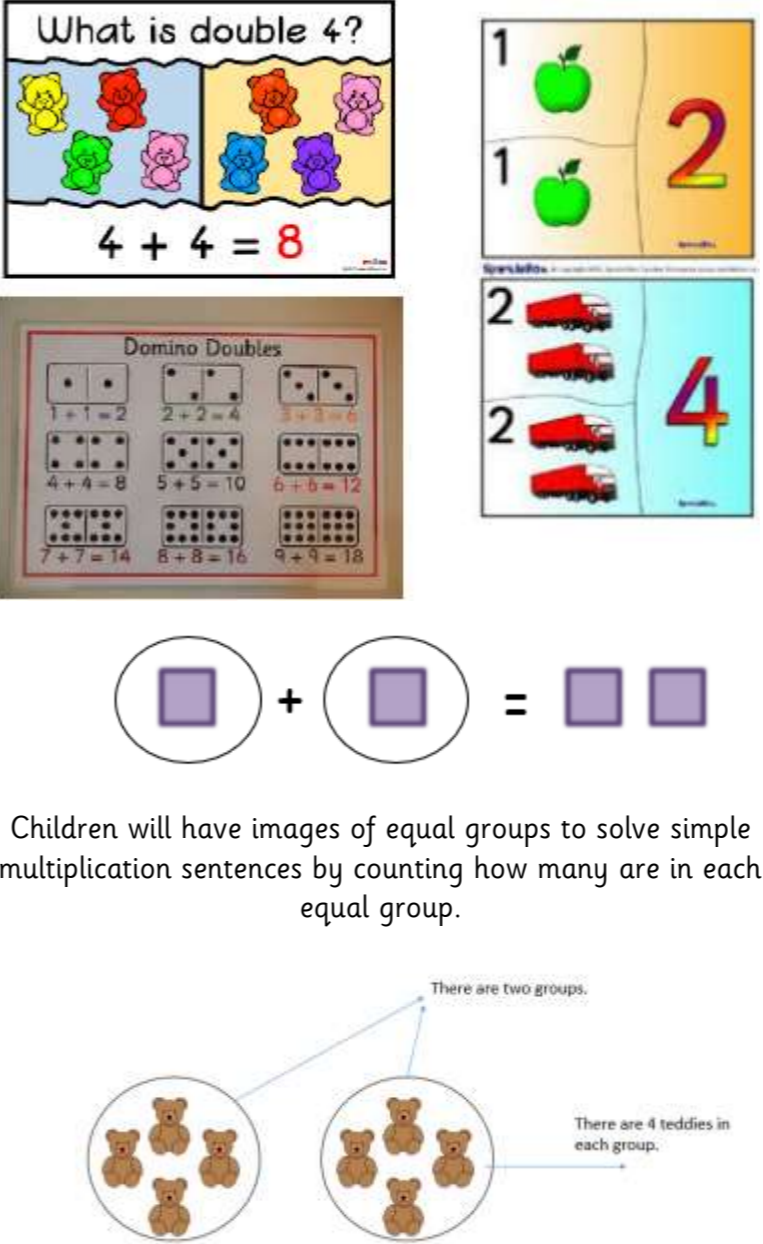


# Deeping St James Community Primary Calculation Policy – Multiplication



## EYFS

**Key Vocabulary:** grouping, doubling, equal

Objective & Strategy	Concrete	Pictorial	Abstract
<p>-To be able to double numbers.</p> <p>-To experience equal groups of objects.</p>	 <p>Use toys and general classroom resources and maths resources for children to physically manipulate. Children will explore doubling and demonstrate it with physical objects.</p> <p>Children will experience and explore equal groups of objects. Children will be encouraged to count the groups, then count how many objects are in a group. E.g. <math>2 \times 4 =</math></p> <p>Physical and real-life examples that encourage children to see concept of doubling as adding two equal groups.</p>	<p>Pictures and icons that encourage children to see concept of doubling as adding two equal groups. Children will begin to draw pictorial representations to demonstrate doubling.</p>  <p>Children will have images of equal groups to solve simple multiplication sentences by counting how many are in each equal group.</p>	<p>A focus on symbols and numbers to form addition calculations to model adding two equal groups and doubles.</p> <p><math>1 + 1 = 2</math></p> <p><math>2 + 2 = 4</math></p> <p><math>3 + 3 = 6</math></p> <p><math>4 + 4 = 8</math></p> <p><math>5 + 5 = 10</math></p>


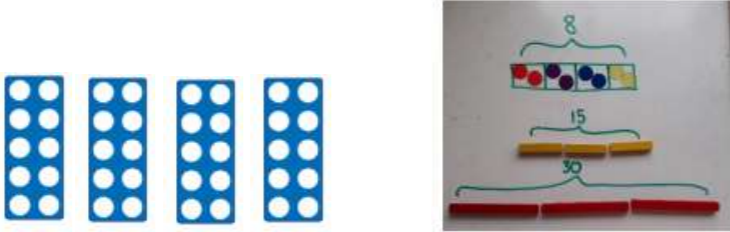
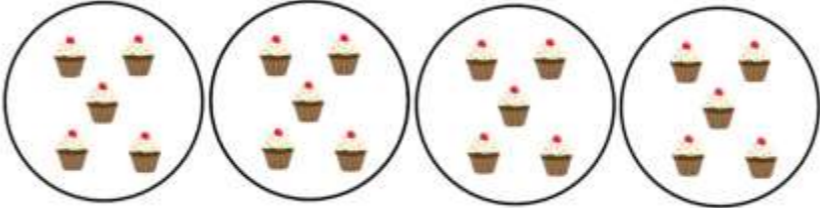
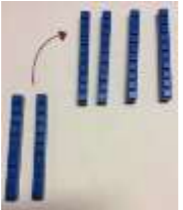
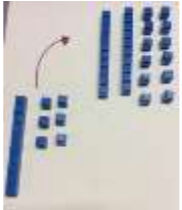
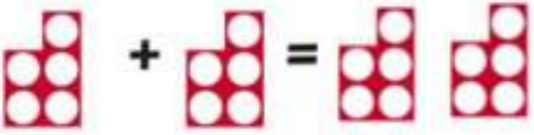
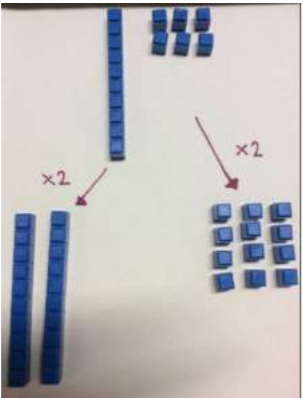
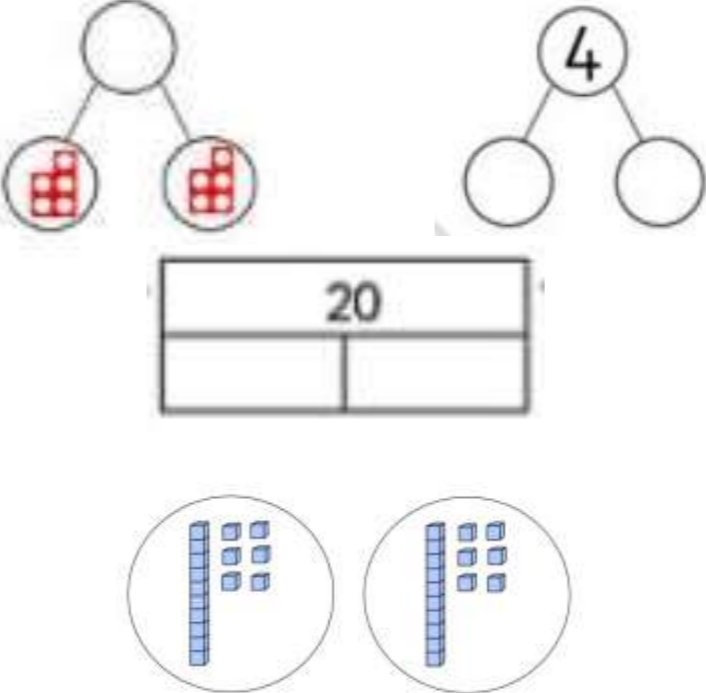
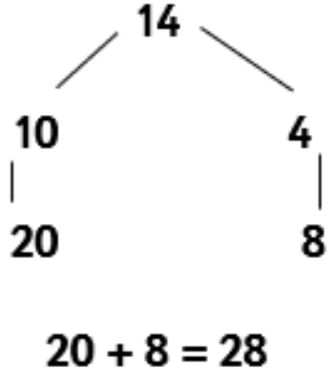


# Deeping St James Community Primary Calculation Policy – Multiplication



## Year 1


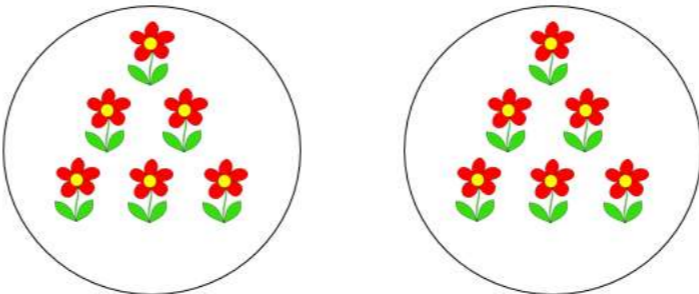
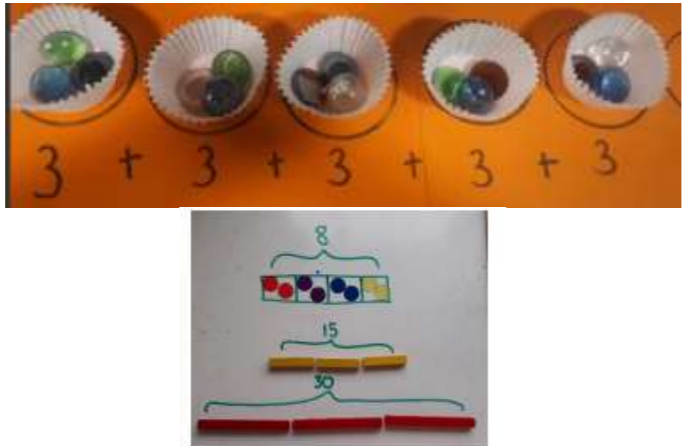
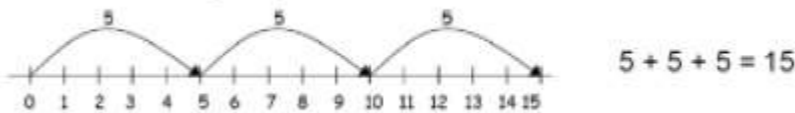
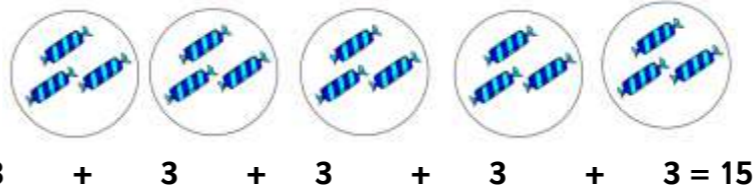




**Key Vocabulary:** grouping, doubling, equal, groups of, lots of, times, array, altogether, multiply, count

Objective & Strategy	Concrete	Pictorial	Abstract
<p>-To count in steps of 2, 5 and 10s.</p>	<p>Children will be able to use concrete resources to count in steps of 2, 5 and 10.</p>  <p>Children will use numicon, counters, cubes to show counting in steps of 2, 5 and 10.</p> 	<p>Children will verbally say their number sequence aloud to demonstrate their understanding. Children would begin to count aloud and write numbers to match the sequence. E.g. 0, 5, 10, 15, 20...</p> 	<p>Children will be able to count aloud in sequences, starting at different points.</p> <p>Children will be able to write sequences with multiples of numbers</p> <p><b>2, 4, 6, 8...</b></p> <p><b>10, 20, 30, 40...</b></p> <p><b>5, 10, 15, 20, 25, 30...</b></p>
<p>-To double numbers up to 20.</p>	<p>Children will demonstrate knowledge of doubling through concrete resources.</p>  <p>Double 20 equals 40.</p>  <p>Double 16 equals 32</p>  <p>Double 5 equals 10</p>  <p>When beginning to double more complex numbers, children will need to explore partitioning the whole number into tens and ones, using base 10, and double the tens and then the ones, before recombining to find the total.</p>	<p>Children will be able to use jottings and pictorial representations to show demonstration of doubling. Use the part whole method and bar models to show doubling alongside other pictorial representations.</p>  <p>Double 16 equals 32</p>	<p>Children will learn to partition a number and then double each part before recombining it back together.</p>  <p><b>20 + 8 = 28</b></p>



# Deeping St James Community Primary Calculation Policy – Multiplication



<p>-To make equal groups and count the total.</p>	<p>Children will use concrete resources (cubes, bead strings, numicon) to make equal groups.</p>  <p>'I know there are <b>2</b> groups with <b>6</b> in each group.'</p>	<p>Children will draw jottings and have pictorial representations to demonstrate knowledge of equal groups.</p> <p><b>2 x 6 = 12</b></p>  <p>I know there are <b>2</b> groups and in each group there are <b>6</b> flowers.</p>	<p>Understand as a written calculation</p> <p><b>2 x 6 = 12</b></p> <p>'I know there are <b>2</b> groups with <b>6</b> in each group.'</p>
<p>-To understand multiplication as repeated addition.</p>	<p>Use of real objects, counters, cubes, numicon and bead strings to add equal groups.</p> 	<p>Use pictorial representations, including the use of a number line to solve problems.</p>  <p>There are 3 sweets in 1 bag. How many sweets are in 5 bags altogether?</p>  	<p>Understand and write repeated addition number sentences to describe pictures or objects.</p> <p><b>3 + 3 + 3 + 3 + 3 = 15</b></p>
<p>-To understand multiplication as arrays.</p>	<p>Create arrays using various concrete objects, which they then can describe what it represents e.g. 2 lots of 5, 3 lots of 10.</p> 	<p>Draw pictorial representations and have the visually provided ones to show understanding of arrays.</p> <p>2 lots of 5</p>  <p>3 lots of 2.</p> 	<p>Understand as a written calculation</p> <p><b>3 x 2 = 6</b></p> <p><b>2 x 5 = 10</b></p>

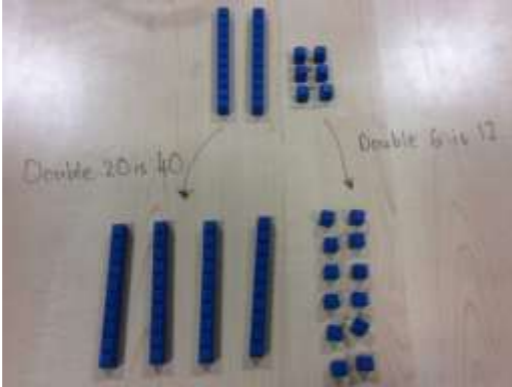





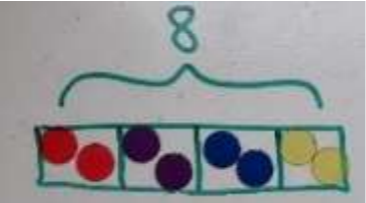
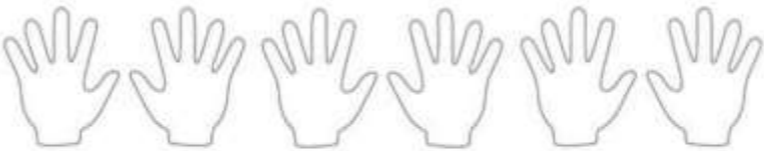
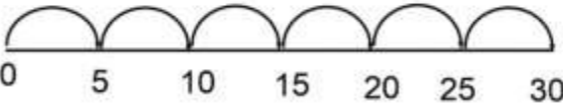
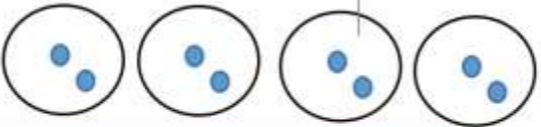



# Deeping St James Community Primary Calculation Policy – Multiplication



## Year 2

**Key Vocabulary:** grouping, doubling, equal, groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative law, inverse, sets of, lots of, equal groups, times, times as big as, once, twice, three times...

Objective & Strategy	Concrete	Pictorial	Abstract
<p>-To double numbers up to 100.</p>	<p>Use concrete apparatus base 10, place value counters or numicon to represent the numbers. Use base 10 or place value counters to partition a number before doubling. Double the ones then tens and recombine.</p> <p><b>Double 26 is 52</b></p> 	<p>Use pictorial representations to show how to double numbers.</p> <p><b>Double 26 is 52</b></p> 	<p>Partition a number and then double each part before recombining back together.</p> <p><b>Double 26</b></p> $\begin{array}{r} 20 + 20 = 40 \\ 6 + 6 = 12 \\ \hline 52 \end{array}$ <p>or</p> $\begin{array}{r} 26 \\ \swarrow \quad \searrow \\ 20 \quad 6 \\ \times 2 \quad \times 2 \\ \hline 40 \quad + \quad 12 = 52 \end{array}$
<p>-To count in multiples of 2s, 3s, 5s and 10s (repeated addition).</p>	<p>Use concrete apparatus (counters, cubes, bead strings) to show the groups. Count the groups; as children are skip counting, children may use their fingers as they are skip counting. Also use bar models.</p>  $5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$    	<p>Use a variety of pictorial representations to show representation of counting in multiples.</p> <p><math>6 \times 5 = 30</math></p>   <p><math>4 \times 2 =</math></p>  <p><math>5 \times 3 =</math></p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p><b>0, 2, 4, 6, 8, 10</b></p> <p><b>0, 3, 6, 9, 12, 15</b></p> <p><b>0, 5, 10, 15, 20, 25, 30</b></p> <p><math>4 \times 3 = 3 + 3 + 3 + 3 = \square</math></p>

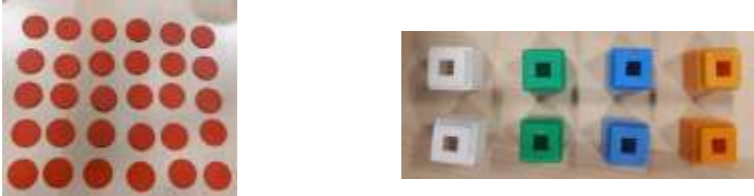


# Deeping St James Community Primary Calculation Policy – Multiplication




-To understand and show that multiplication is commutative.

Use concrete apparatus (base 10/ place value counters, cubes) to create arrays.



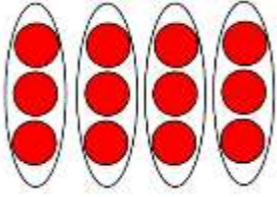
Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.



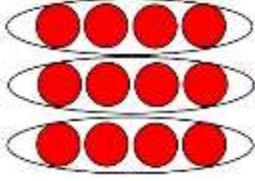
$4 \times 3 = 12$                        $3 \times 4 = 12$

Use a range of pictures to represent arrays to show different calculations and show commutativity.

$4 \times 3 = 12$



$3 \times 4 = 12$

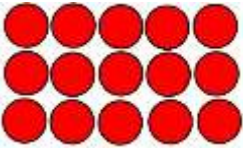


Write the different multiplication sentences to show the commutative law.

$12 = 3 \times 4$

$12 = 4 \times 3$

Use an array to write multiplication number sentences and reinforce repeated addition.



$3 + 3 + 3 + 3 + 3 = 15$                        $5 \times 3 = 15$


$5 + 5 + 5 = 15$                                        $3 \times 5 = 15$

-To use related multiplication and division facts using the inverse for the 2-, 3-, 5- and 10-times table.

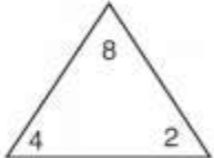
This should be taught alongside division to show how the numbers relate and build fluency.

Use concrete resources (cubes, counters, base 10) to represent arrays. These will then form part of the learning process to explain number related facts and begin to write these in number form.

$2 \times 4 = 8$        $4 \times 2 = 8$        $8 \div 2 = 4$        $8 \div 4 = 2$



Use pictorial representations to solve missing number facts that demonstrate related facts.



$\times$   =

$\times$   =

$\div$   =

$\div$   =

Record all 8 related number sentences to demonstrate related facts.

**$2 \times 4 = 8$**

**$4 \times 2 = 8$**

**$8 \div 2 = 4$**

**$8 \div 4 = 2$**

**$8 = 2 \times 4$**

**$8 = 4 \times 2$**

**$2 = 8 \div 4$**

**$4 = 8 \div 2$**

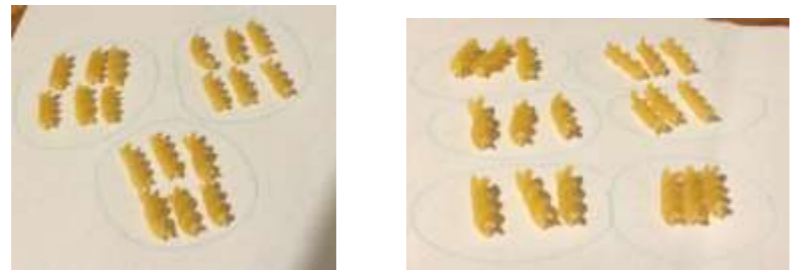
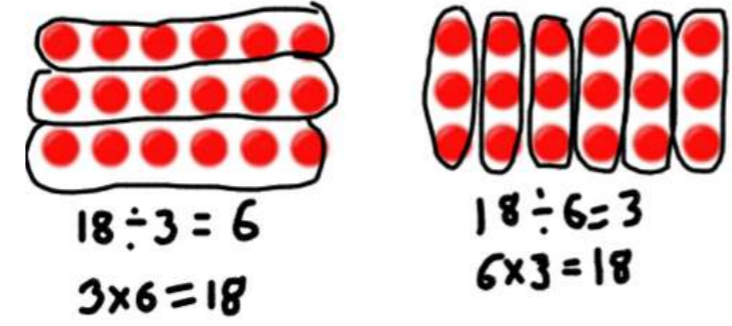
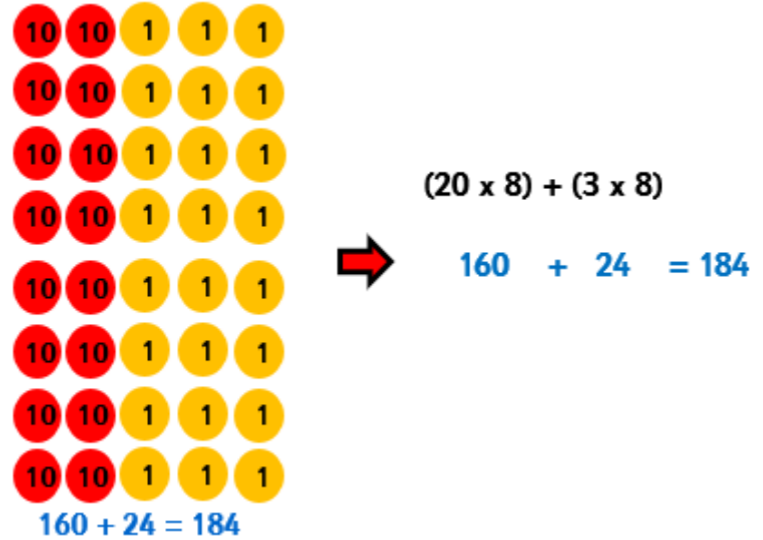
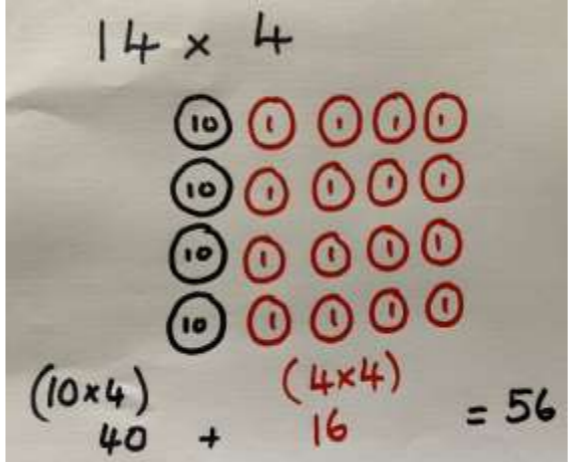


# Deeping St James Community Primary Calculation Policy – Multiplication



## Year 3

**Key Vocabulary:** grouping, doubling, equal, groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative law, inverse, sets of, lots of, equal groups, times, times as big as, once, twice, three times..., **partition**, **grid method**, **total**, **multiple**, **product**, **tens**, **ones**, **value**

Objective & Strategy	Concrete	Pictorial	Abstract																		
<p>-To use related multiplication and division facts using the inverse for the 2-, 3-, 4-, 5-, 8- and 10- times table.</p>	<p>Use concrete apparatus (base 10, counters, cubes) to understand the link between multiplication and division and to find related facts.</p> <p><math>3 \times 6 = 18</math>   <math>18 \div 3 = 6</math>   <math>6 \times 3 = 18</math>   <math>18 \div 6 = 3</math></p> 	<p>Use pictorial representations to show an array pictorially then find the associated multiplication and division facts by sorting into equal groups.</p> 	<p>Apply understanding of inverse relationships to write related multiplication and division statements.</p> <p><math>3 \times 6 = 18</math>                      <math>18 = 3 \times 6</math>  <math>6 \times 3 = 18</math>                      <math>18 = 6 \times 3</math>  <math>18 \div 3 = 6</math>                      <math>6 = 18 \div 3</math>  <math>18 \div 6 = 3</math>                      <math>3 = 18 \div 6</math></p> <p>Use associated vocabulary correctly and know what each number represents in the calculation.</p> <table border="1" data-bbox="2092 829 2864 1018"> <thead> <tr> <th>multiplier</th> <th>multiplicand</th> <th>product</th> <th>dividend</th> <th>divisor</th> <th>quotient</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>6</td> <td>18</td> <td>18</td> <td>3</td> <td>6</td> </tr> <tr> <td>number of groups</td> <td>number in each group</td> <td>number in all</td> <td>number in all</td> <td>number of groups</td> <td>number in each group</td> </tr> </tbody> </table>	multiplier	multiplicand	product	dividend	divisor	quotient	3	6	18	18	3	6	number of groups	number in each group	number in all	number in all	number of groups	number in each group
multiplier	multiplicand	product	dividend	divisor	quotient																
3	6	18	18	3	6																
number of groups	number in each group	number in all	number in all	number of groups	number in each group																
<p>-To use partitioning to support multiplication calculations.</p>	<p>Use concrete apparatus (place value counter, counters, base 10) to introduce the partitioned method by using arrays to demonstrate the links.</p> <p><math>23 \times 8 = 184</math></p> 	<p>Use pictorial representations of place value counters, counters, base 10. They can draw the counters (using colours to show different amounts or just use the circles in the different columns) or base 10.</p> 	<p>Start with multiplying by one-digit numbers using partitioning, showing the clear addition.</p> <p><b><math>14 \times 6</math></b></p> <p><b><math>(10 \times 6) + (4 \times 6)</math></b></p> <p><b><math>60 + 24 = 84</math></b></p>																		



# Deeping St James Community Primary Calculation Policy – Multiplication


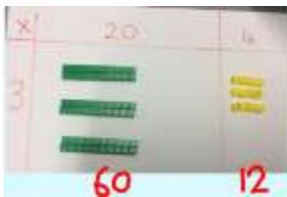



-To use a formal written method of multiplication (partitioned column method).

2-digit x 1-digit number

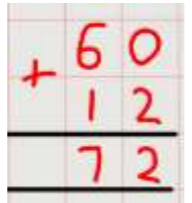
Children use partitioning to multiply numbers. Children use base ten and place value counters to represent arrays of the partitioned number.

$24 \times 3 = 72$

Cubes  Base 10 

Place Value Counters 

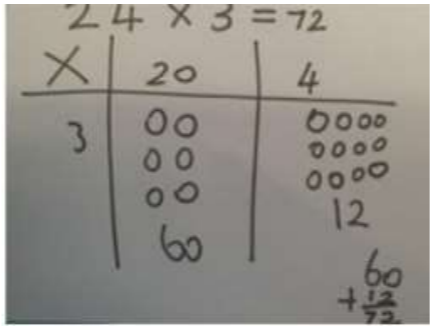
Find the total:  
 $60 + 12 = 72$  or if required:



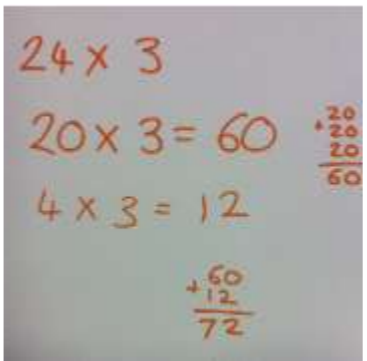
Encourage regrouping mentally rather than using a formal method for efficiency.

Children show their understanding by represent the calculation by partitioning using their own pictorial representation.

$24 \times 3 = 72$

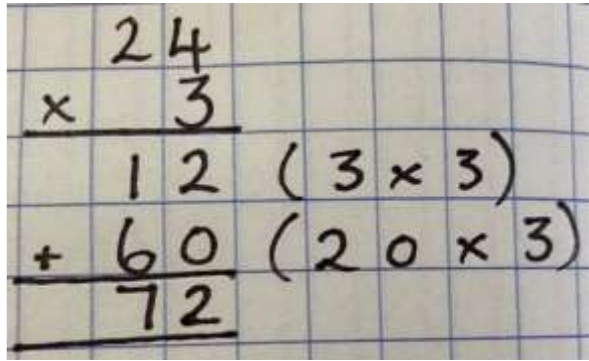


Also use jottings to partition the multiplicand and multiply each part by the multiplier.



Formal written partitioned method:

Children need to be secure with partitioning and related facts progress to the abstract method with regrouping as shown below. Use concrete apparatus alongside as a support if required.

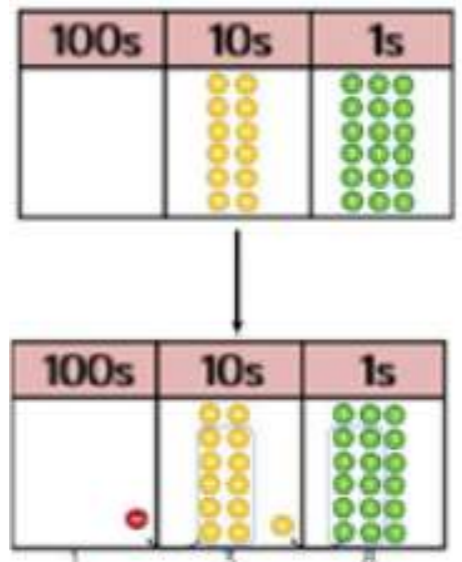


-To use a formal written method of multiplication (short multiplication).

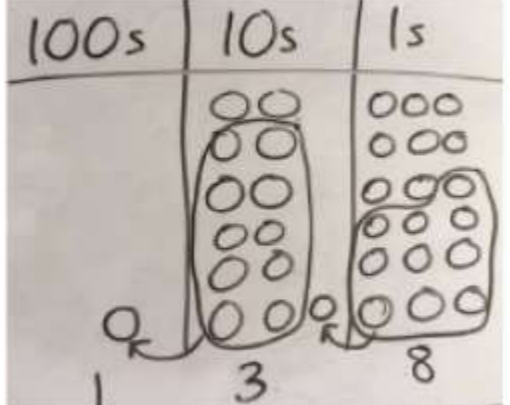
2-digit x 1-digit number

Use concrete apparatus (place value counter, counters, base 10) as per the partitioned method to support the formal method of short multiplication.

$6 \times 23$



Use pictorial representations of place value counters, counters, base 10. They can draw the counters (using colours to show different amounts or just use the circles in the different columns) or base 10.



Formal written short multiplication method:

$$\begin{array}{r}
 6 \times 23 = \\
 23 \\
 \times 6 \\
 \hline
 138 \\
 \hline
 11
 \end{array}$$

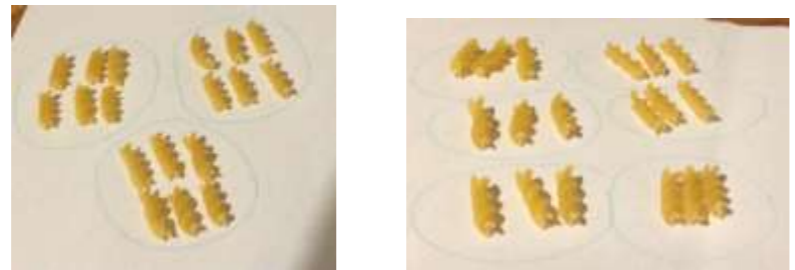
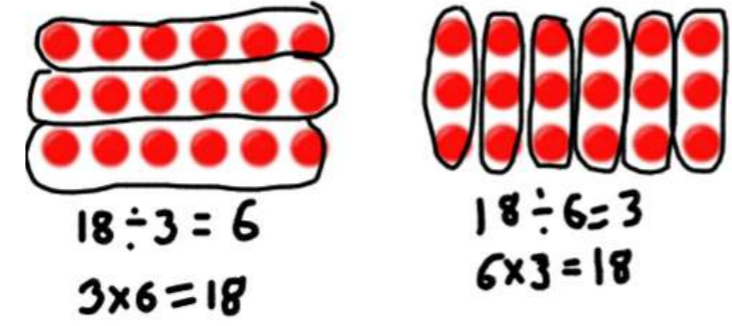
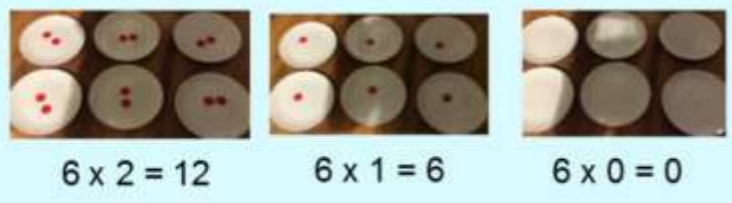
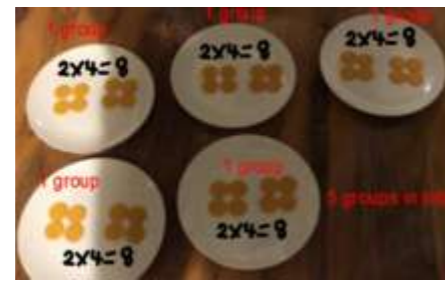
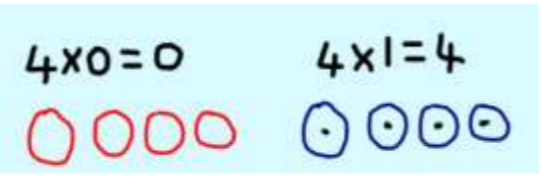
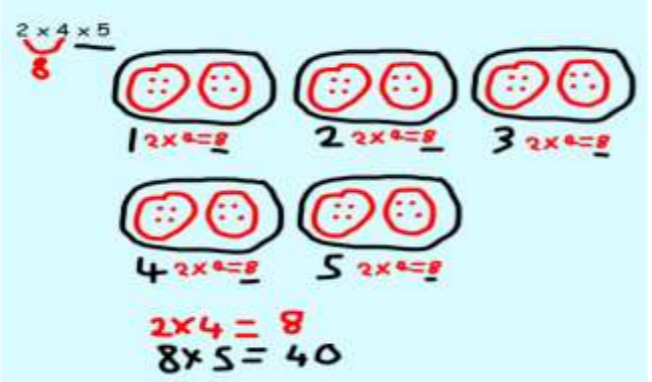
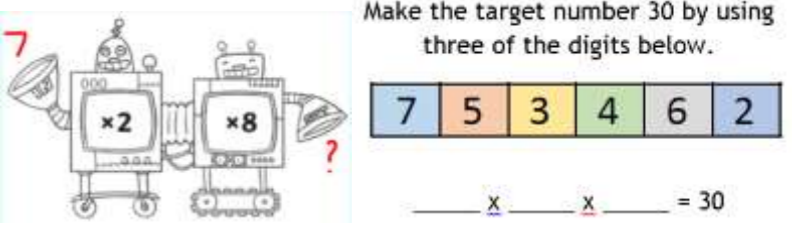


# Deeping St James Community Primary Calculation Policy – Multiplication



## Year 4

**Key Vocabulary:** grouping, doubling, equal, groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative law, inverse, sets of, lots of, equal groups, times, times as big as, once, twice, three times..., partition, grid method, total, multiple, product, tens, ones, value, **hundreds, thousands, factor**

Objective & Strategy	Concrete	Pictorial	Abstract																		
<p>-To recall multiplication and division facts for multiplication tables up to 12x 12.</p>	<p>Use concrete apparatus (base 10, counters, cubes) to understand the link between multiplication and division and to find related facts.</p> <p><math>3 \times 6 = 18</math>   <math>18 \div 3 = 6</math>   <math>6 \times 3 = 18</math>   <math>18 \div 6 = 3</math></p> 	<p>Use pictorial representations to show an array pictorially then find the associated multiplication and division facts by sorting into equal groups.</p> 	<p>Apply understanding of inverse relationships to write related multiplication and division statements.</p> <p><math>3 \times 6 = 18</math>   <math>18 = 3 \times 6</math>  <math>6 \times 3 = 18</math>   <math>18 = 6 \times 3</math>  <math>18 \div 3 = 6</math>   <math>6 = 18 \div 3</math>  <math>18 \div 6 = 3</math>   <math>3 = 18 \div 6</math></p> <p>Use associated vocabulary correctly and know what each number represents in the calculation.</p> <table border="1" data-bbox="2092 829 2864 1018"> <tr> <td>multiplier</td> <td>multiplicand</td> <td>product</td> <td>dividend</td> <td>divisor</td> <td>quotient</td> </tr> <tr> <td>3</td> <td>×</td> <td>6</td> <td>=</td> <td>18</td> <td></td> </tr> <tr> <td>number in all groups</td> <td></td> <td>number in each group</td> <td></td> <td>number in all</td> <td>number in each group</td> </tr> </table>	multiplier	multiplicand	product	dividend	divisor	quotient	3	×	6	=	18		number in all groups		number in each group		number in all	number in each group
multiplier	multiplicand	product	dividend	divisor	quotient																
3	×	6	=	18																	
number in all groups		number in each group		number in all	number in each group																
<p>-To multiply and divide mentally, including: multiplying by 0 and 1 and multiplying together 3 numbers.</p>	<p>Multiply and divide numbers by zero and one. Understand the meaning of the calculation and the need of equal sized groups.</p>  <p>Use objects to calculate totals when three numbers are multiplied together.</p> <p><math>2 \times 4 \times 5 = 40</math></p> 	<p>Show understanding of multiplying by 0 and 1 by drawing representations.</p> <p><math>4 \times 0 = 0</math>   <math>4 \times 1 = 4</math></p>  <p>Use objects to calculate totals when three numbers are multiplied together.</p> <p><math>2 \times 4 \times 5 = 40</math></p>  <p>Or may be represented as:  <math>2 \times (4 \times 5)</math>   <math>2 \times (20) = 40</math></p>	<p>Understand how to multiply by 1 and 0 and apply to word problems.</p> <p><math>1 \times 83 =</math>   <math>76 \times 1 =</math>  <math>4567 \times 0 =</math>   <math>0 \times 23 =</math></p> <p><i>Jack earns £12 a week on his paper round. He did not work for one week whilst he was on holiday. How much did he earn?</i></p> <p>Solve number puzzles using the knowledge of multiplying 3 single digit numbers.</p> 																		





# Deeping St James Community Primary Calculation Policy – Multiplication



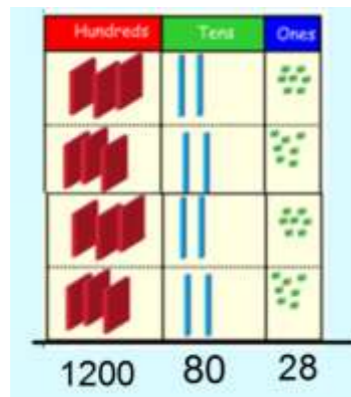
Pupils should be using formal written methods of column multiplication where appropriate.

Recap the partitioned column method introduced in Y3 - use partitioning to multiply numbers. Children use base ten and place value counters to represent arrays of the partitioned number.

$$327 \times 4 = 1308$$



$$1200 + 80 + 28 = 1308$$



$$1200 + 80 + 28 = 1308$$

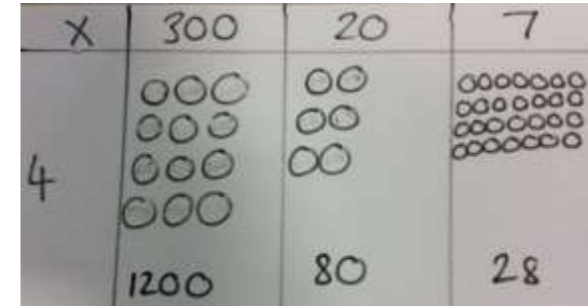
Encourage regrouping mentally rather than using a formal method for efficiency.

-To use a formal written method of multiplication (partitioned column method).

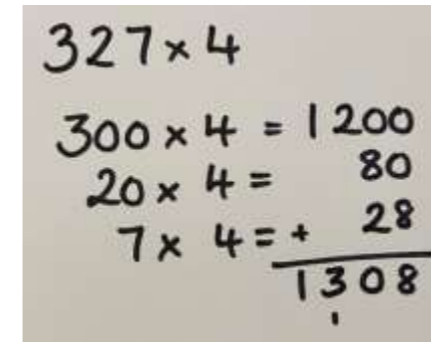
3-digit x 1-digit number

Children show their understanding by represent the calculation by partitioning using their own pictorial representation.

$$327 \times 4 = 1308$$

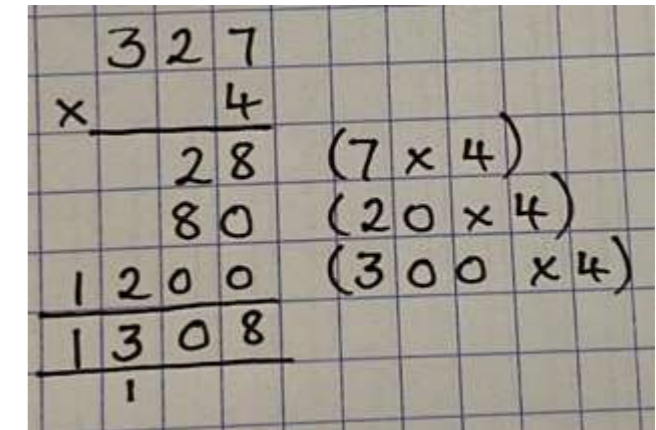


Also use jottings to partition the multiplicand and multiply each part by the multiplier.



Formal written partitioned method:

Children in Y4 may still require the steps set out in the partitioned method as they progress to multiplying 3-digit x 1-digit numbers. Use concrete apparatus alongside as an additional support if required.



Pupils should be using formal written methods of column multiplication where appropriate.

Use concrete apparatus (place value counter, counters, base 10) as per the partitioned method to support the formal method of short multiplication.

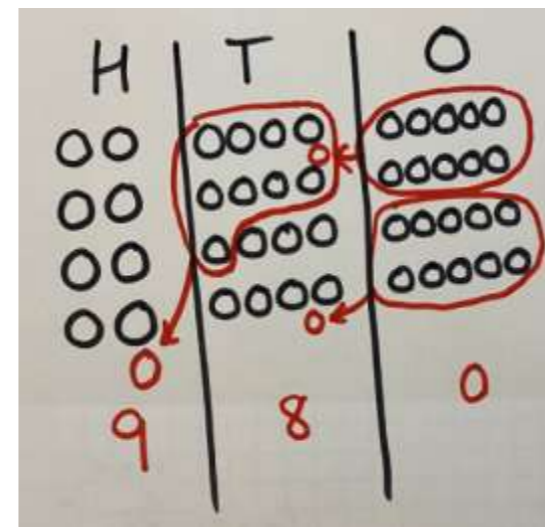
$$4 \times 245$$



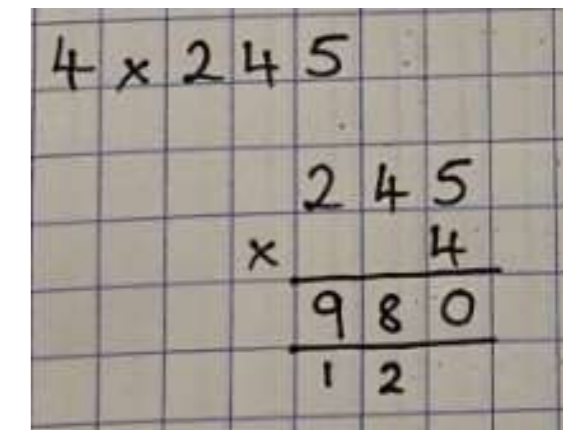
-To use a formal written method of multiplication (short multiplication).

3-digit x 1-digit number

Use pictorial representations of place value counters, counters, base 10. They can draw the counters (using colours to show different amounts or just use the circles in the different columns) or base 10.



Formal written short multiplication method:



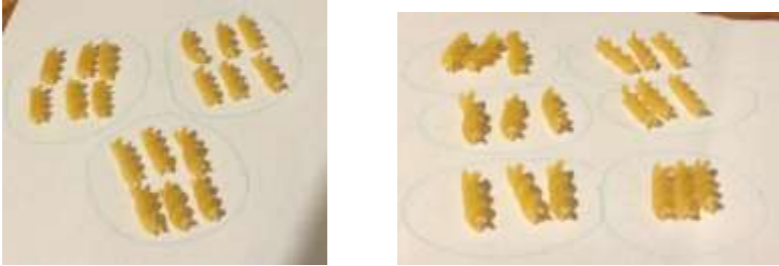
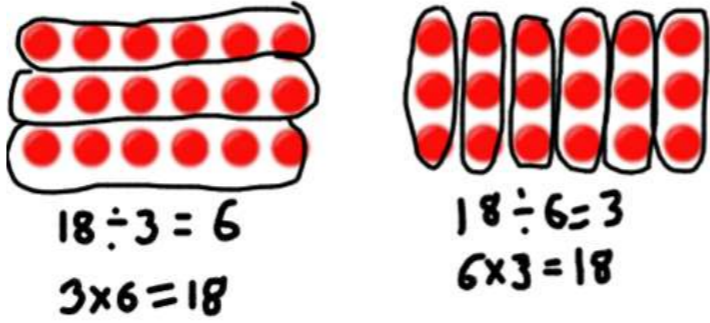
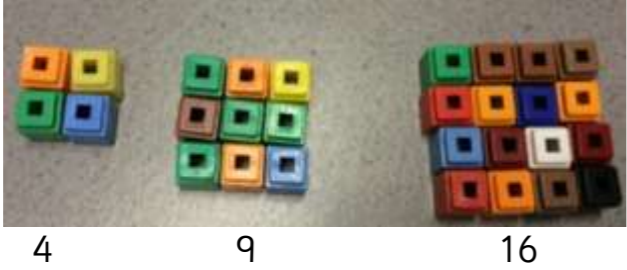
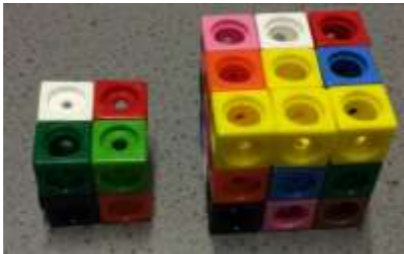
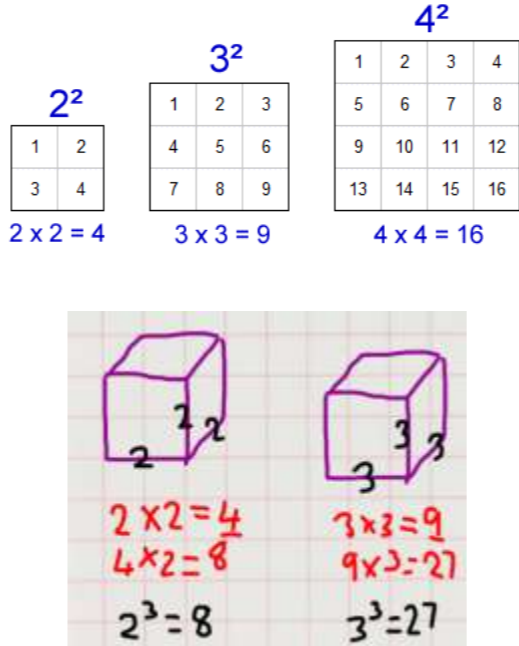


# Deeping St James Community Primary Calculation Policy – Multiplication



## Years 5

**Key Vocabulary:** grouping, doubling, equal, groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative law, inverse, sets of, lots of, equal groups, times, times as big as, once, twice, three times..., partition, grid method, total, multiple, product, tens, ones, value, hundreds, thousands, factor, square, cube, integer, decimal, short multiplication, long multiplication, 'carry', composite numbers, prime numbers, prime factors

Objective & Strategy	Concrete	Pictorial	Abstract																		
<p>-To recall multiplication and division facts for multiplication tables up to 12x 12.</p>	<p>Use concrete apparatus (base 10, counters, cubes) to understand the link between multiplication and division and to find related facts.</p> <p><math>3 \times 6 = 18</math>   <math>18 \div 3 = 6</math>   <math>6 \times 3 = 18</math>   <math>18 \div 6 = 3</math></p> 	<p>Use pictorial representations to show an array pictorially then find the associated multiplication and division facts by sorting into equal groups.</p>  <p><math>18 \div 3 = 6</math> <math>3 \times 6 = 18</math></p> <p><math>18 \div 6 = 3</math> <math>6 \times 3 = 18</math></p>	<p>Apply understanding of inverse relationships to write related multiplication and division statements.</p> <p><math>3 \times 6 = 18</math>   <math>18 = 3 \times 6</math>  <math>6 \times 3 = 18</math>   <math>18 = 6 \times 3</math>  <math>18 \div 3 = 6</math>   <math>6 = 18 \div 3</math>  <math>18 \div 6 = 3</math>   <math>3 = 18 \div 6</math></p> <p>Use associated vocabulary correctly and know what each number represents in the calculation.</p> <table border="1" data-bbox="2092 861 2864 1060"> <thead> <tr> <th>multiplier</th> <th>multiplier</th> <th>product</th> <th>dividend</th> <th>divisor</th> <th>quotient</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>6</td> <td>18</td> <td>18</td> <td>3</td> <td>6</td> </tr> <tr> <td>number in all groups</td> <td>number in each group</td> <td>number in all</td> <td>number in all</td> <td>number of groups</td> <td>number in each group</td> </tr> </tbody> </table>	multiplier	multiplier	product	dividend	divisor	quotient	3	6	18	18	3	6	number in all groups	number in each group	number in all	number in all	number of groups	number in each group
multiplier	multiplier	product	dividend	divisor	quotient																
3	6	18	18	3	6																
number in all groups	number in each group	number in all	number in all	number of groups	number in each group																
<p>-To recognise and use square numbers and cube numbers.</p>	<p>Use resources to explore squared and cubed numbers.</p> <p>Square numbers</p>  <p>4   9   16</p> <p>Cubed numbers</p>  <p>8   27</p>	<p>Represent squared and cubed numbers pictorially. They use the correct notation for squared (<sup>2</sup>) and cubed (<sup>3</sup>).</p>  <p><math>2^2</math>   <math>3^2</math>   <math>4^2</math></p> <p><math>2 \times 2 = 4</math>   <math>3 \times 3 = 9</math>   <math>4 \times 4 = 16</math></p> <p><math>2 \times 2 = 4</math>   <math>3 \times 3 = 9</math>  <math>4 \times 2 = 8</math>   <math>9 \times 3 = 27</math>  <math>2^3 = 8</math>   <math>3^3 = 27</math></p>	<p>Find and recognise squared and cubed numbers and use the correct notation for squared (<sup>2</sup>) and cubed (<sup>3</sup>).</p> <p><math>2^2</math> or <math>2 \times 2 = 4</math></p> <p><math>3^2</math> or <math>3 \times 3 = 9</math></p> <p><math>4^2</math> or <math>4 \times 4 = 16</math></p> <p><math>1^3 = 1 \times 1 \times 1 = 1</math>  <math>2^3 = 2 \times 2 \times 2 = 8</math>  <math>3^3 = 3 \times 3 \times 3 = 27</math>  <math>4^3 = 4 \times 4 \times 4 = 64</math></p>																		



# Deeping St James Community Primary Calculation Policy – Multiplication



-To multiply whole numbers and those involving decimals by 10, 100 and 1,000

Use resources to understand what 10, 100 and 1000 times bigger looks like.



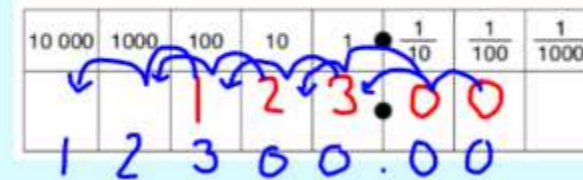
Use place value grids to multiply numbers by 10, 100 and 1000s. They understand the movement of the digits on the place value grid.

### Multiplying

- X 10    digits move LEFT 1 space
- X 100    digits move LEFT 2 spaces
- X 1000    digits move LEFT 3 spaces

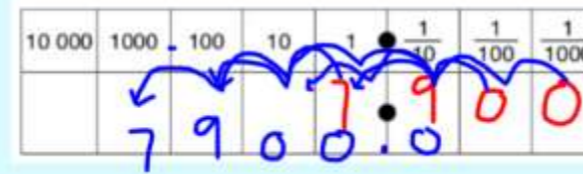


$$123 \times 100 = 12300$$



Apply this knowledge to decimal numbers.

$$7.9 \times 1000 = 7900$$



**At this stage pupils should be encouraged to work in the abstract using the formal methods to multiply larger numbers efficiently.**

As Year 4 but progressing onto 4-digit x 1-digit numbers. Use concrete apparatus – if required - (place value counter, counters, base 10) as per the partitioned method to support the formal method of short multiplication.

$$4 \times 1325 = 5300$$

Thousands	Hundreds	Tens	Ones
1000	100 100 100	10 10	1 1 1 1 1
1000	100 100 100	10 10	1 1 1 1 1
1000	100 100 100	10 10	1 1 1 1 1
1000	100 100 100	10 10	1 1 1 1 1

-To use a formal written method of multiplication (short multiplication).

4-digit x 1-digit number

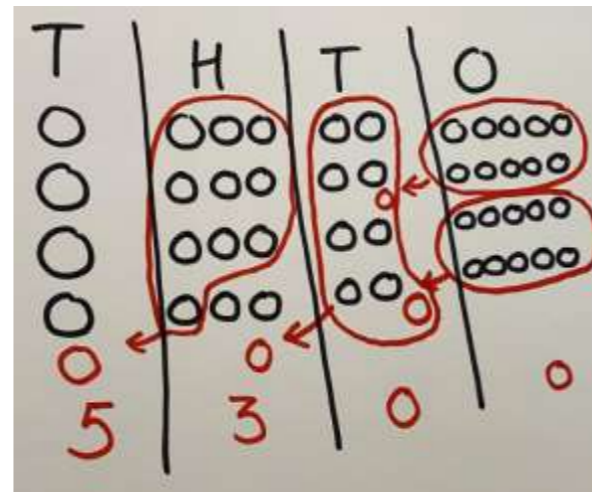
$$5 \times 4 = 20$$

$$20 \times 4 = 80$$

$$300 \times 4 = 1200$$

$$1000 \times 4 = 4000$$

Use pictorial representations – if required - of place value counters, counters, base 10. They can draw the counters (using colours to show different amounts or just use the circles in the different columns) or base 10.



Apply knowledge of place value to multiply numbers by 10, 100 and 1000, including decimal numbers.

$$34 \times 100 = 3400$$

$$1234 \times 1000 = 1234000$$

$$5.6 \times 10 = 56$$

$$12.367 \times 100 = 1236.7$$

Apply knowledge to word and number puzzles.

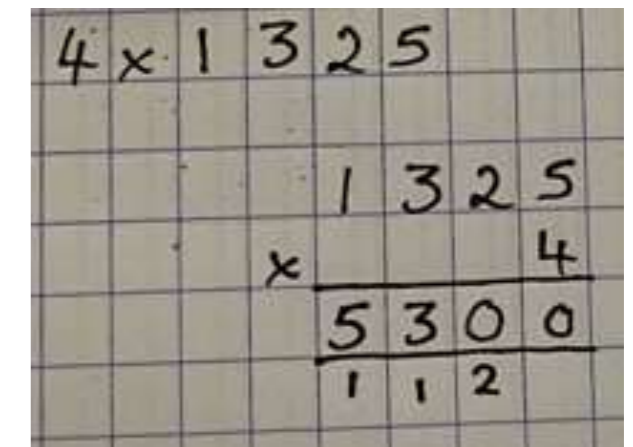
Complete these calculations.

$$15 \times 100 = \boxed{\phantom{000}}$$

$$\boxed{\phantom{000}} \times 10 = 1500$$

*Breen Airways charges £1600 for a return flight to Australia. King Airlines is ten times cheaper. How much do King Airlines charge?*

Formal written short multiplication method:





# Deeping St James Community Primary Calculation Policy – Multiplication



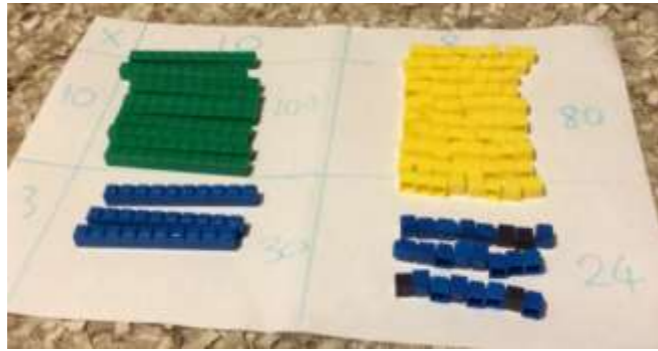
At this stage pupils should be encouraged to work in the abstract using the formal methods to multiply larger numbers efficiently.

-To use a formal written method of multiplication (long multiplication).

Up to 4-digit x 2-digit number

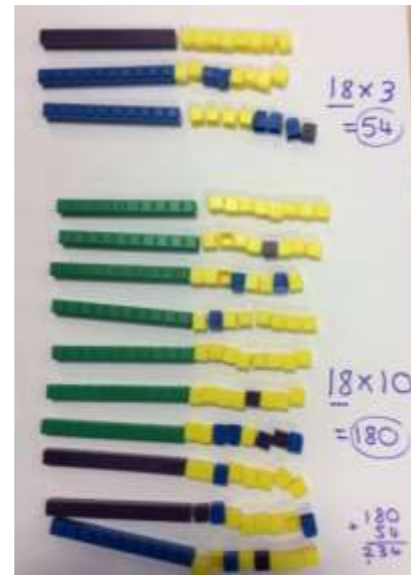
Represent calculations using the place value counters using the partitioning method introduced in Y3.

$18 \times 13 = 234$



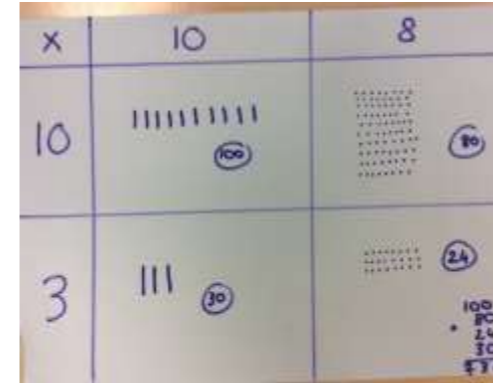
$18 \times 13 = 234$

Children can then solve in a columnar form. They begin by multiplying the ones, then the tens, the hundreds then the thousands before finding the total.

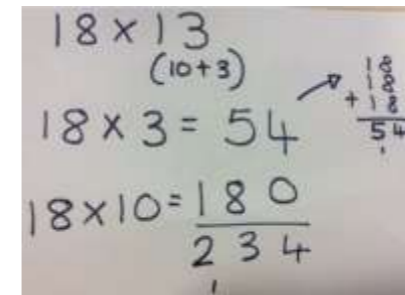


Use knowledge of place value to partition the multiplicand and multiplier. They then show their understand pictorially using a partitioned method.

$18 \times 13 = 234$

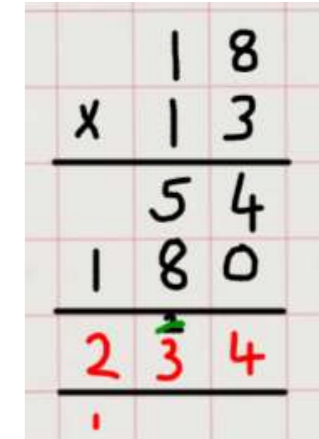


Children then move towards the columnar method by representing each stage with jottings. Children taught to multiply the ones first as in previous years.

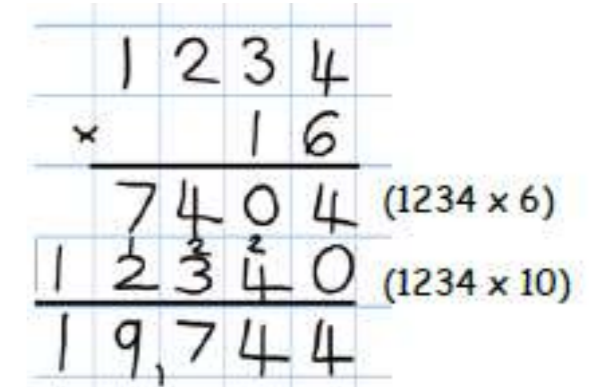


Record written calculation of long multiplication.

$18 \times 13 = 234$



$1234 \times 16$




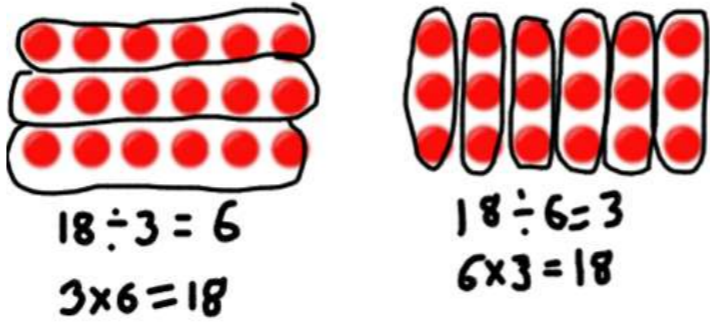
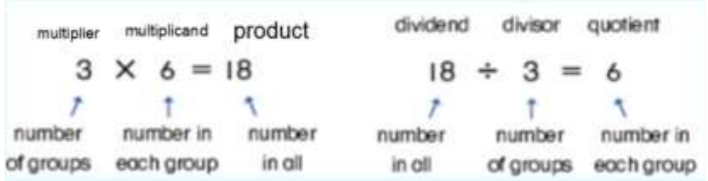

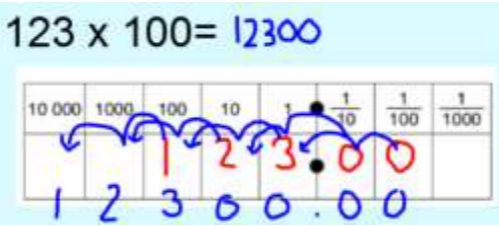
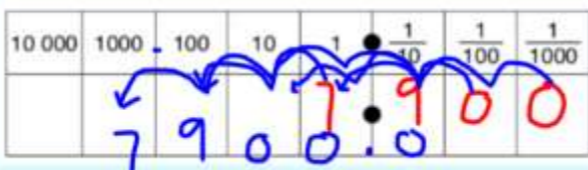


# Deeping St James Community Primary Calculation Policy – Multiplication



## Years 6

**Key Vocabulary:** grouping, doubling, equal, groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, commutative law, inverse, sets of, lots of, equal groups, times, times as big as, once, twice, three times..., partition, grid method, total, multiple, product, tens, ones, value, hundreds, thousands, factor, square, cube, integer, decimal, short multiplication, long multiplication, 'carry', composite numbers, prime numbers, prime factors

Objective & Strategy	Concrete	Pictorial	Abstract
<p><b>At this stage pupils should be encouraged to work in the abstract.</b></p> <p>-To recall multiplication and division facts for multiplication tables up to 12x 12.</p>	<p>Use concrete apparatus (base 10, counters, cubes) to understand the link between multiplication and division and to find related facts.</p> <p><math>3 \times 6 = 18</math>   <math>18 \div 3 = 6</math>   <math>6 \times 3 = 18</math>   <math>18 \div 6 = 3</math></p> 	<p>Use pictorial representations to show an array pictorially then find the associated multiplication and division facts by sorting into equal groups.</p> 	<p>Apply understanding of inverse relationships to write related multiplication and division statements.</p> <p><math>3 \times 6 = 18</math>   <math>18 = 3 \times 6</math>  <math>6 \times 3 = 18</math>   <math>18 = 6 \times 3</math>  <math>18 \div 3 = 6</math>   <math>6 = 18 \div 3</math>  <math>18 \div 6 = 3</math>   <math>3 = 18 \div 6</math></p> <p>Use associated vocabulary correctly and know what each number represents in the calculation.</p> 
<p><b>At this stage pupils should be encouraged to work in the abstract.</b></p> <p>-To multiply whole numbers and those involving decimals by 10, 100 and 1,000</p>	<p>Use resources to understand what 10, 100 and 1000 times bigger looks like.</p> 	<p>Use place value grids to multiply numbers by 10, 100 and 1000s. They understand the movement of the digits on the place value grid.</p> <p><b>Multiplying</b></p> <p>X 10   digits move LEFT 1 space  X 100   digits move LEFT 2 spaces  X 1000   digits move LEFT 3 spaces</p>  <p>Apply this knowledge to decimal numbers.</p> <p><math>7.9 \times 1000 = 7900</math></p> 	<p>Apply knowledge of place value to multiply numbers by 10, 100 and 1000, including decimal numbers.</p> <p><math>34 \times 100 = 3400</math>  <math>1234 \times 1000 = 1234000</math>  <math>5.6 \times 10 = 56</math>  <math>12.367 \times 100 = 1236.7</math></p> <p>Apply knowledge to word and number puzzles.</p> <p>Here are five number cards:</p> <p>0.47   10   100   1000   4.07</p> <p>Use four of the cards to complete these calculations.</p> <p><math>47 \div \square = \square</math></p> <p><math>\square \times \square = 40.7</math></p>



# Deeping St James Community Primary Calculation Policy – Multiplication



**At this stage pupils should be encouraged to work in the abstract using the formal methods to multiply larger numbers efficiently.**

As Year 4 but progressing onto 4-digit x 1-digit numbers. Use concrete apparatus – if required - (place value counter, counters, base 10) as per the partitioned method to support the formal method of short multiplication.

$$4 \times 1325 = 5300$$

Thousands	Hundreds	Tens	Ones
1000	100 100 100	10 10	1 1 1 1 1
1000	100 100 100	10 10	1 1 1 1 1
1000	100 100 100	10 10	1 1 1 1 1
1000	100 100 100	10 10	1 1 1 1 1

-To use a formal written method of multiplication (short multiplication).

4-digit x 1-digit number

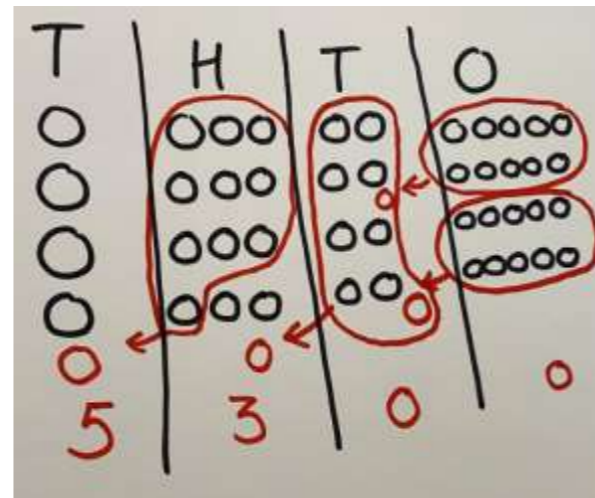
$$5 \times 4 = 20$$

$$20 \times 4 = 80$$

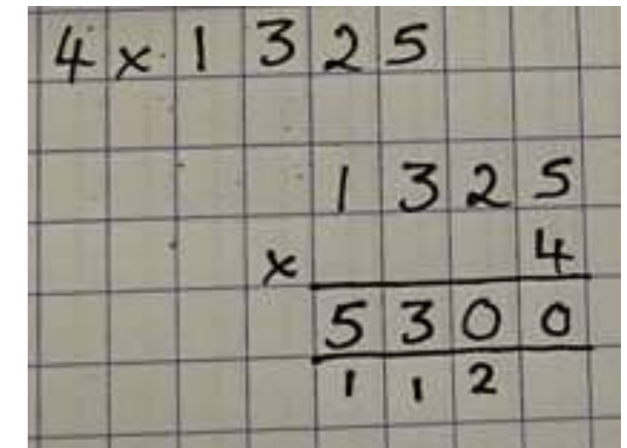
$$300 \times 4 = 1200$$

$$1000 \times 4 = 4000$$

Use pictorial representations – if required - of place value counters, counters, base 10. They can draw the counters (using colours to show different amounts or just use the circles in the different columns) or base 10.



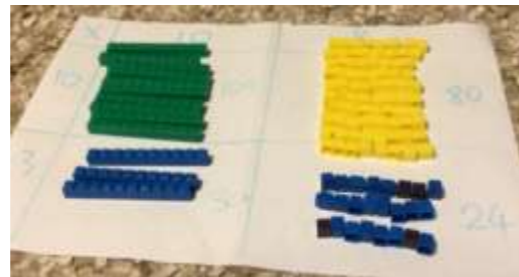
Formal written short multiplication method:



**At this stage pupils should be encouraged to work in the abstract using the formal methods to multiply larger numbers efficiently.**

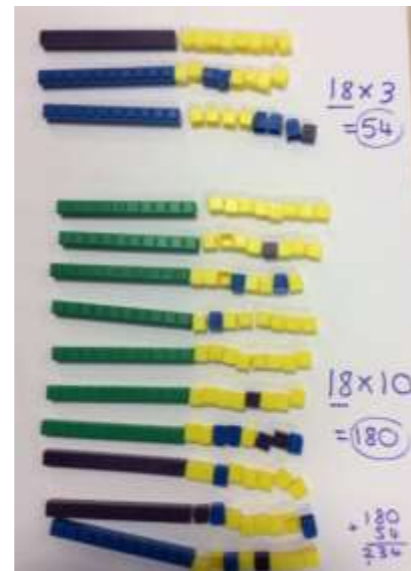
Represent calculations using the place value counters using the partitioning method introduced in Y3.

$$18 \times 13 = 234$$



$$18 \times 13 = 234$$

Children can then solve in a columnar form. They begin by multiplying the ones, then the tens, the hundreds then the thousands before finding the total.

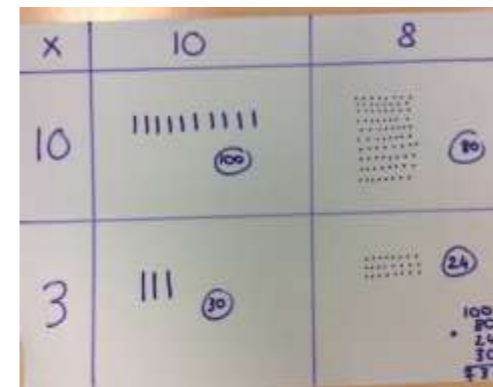


-To use a formal written method of multiplication (long multiplication).

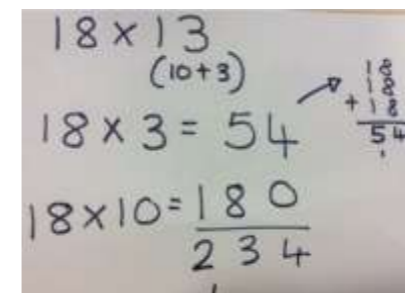
Up to 4-digit x 2-digit number

Use knowledge of place value to partition the multiplicand and multiplier. They then show their understand pictorially using a partitioned method.

$$18 \times 13 = 234$$

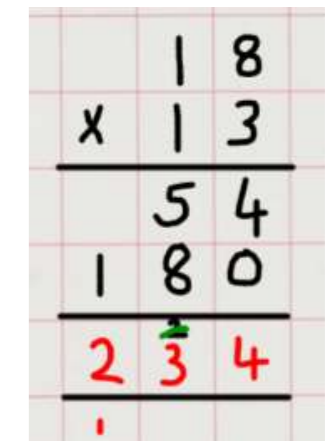


Children then move towards the columnar method by representing each stage with jottings. Children taught to multiply the ones first as in previous years.

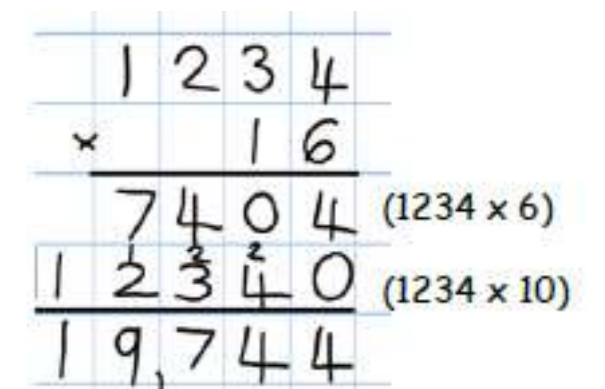


Record written calculation of long multiplication.

$$18 \times 13 = 234$$



$$1234 \times 16$$





# Deeping St James Community Primary Calculation Policy – Multiplication



At this stage pupils should be encouraged to work in the abstract using the formal methods to multiply.

-To use a formal written method of multiplication to multiply number up to 2 decimal places. (Short Multiplication)

Decimal numbers x 1-digit number

Represent calculations using the place value counters and base ten equipment. They partition the decimal number and multiply by the multiplier. They then find the total.

$$4.92 \times 3 = 14.76$$

4.92 x 3

4 x 3 = 12

0.9 x 3 = 2.7

0.02 x 3 = 0.06

12.00  
+ 2.70  
+ 0.06  
-----  
14.76

Continue to multiply decimal numbers by partitioning the decimal number. Draw pictorial representations and use jottings to find the total.

$$4.92 \times 3 = 14.76$$

4.92 x 3

4 x 3 = 12

0.9 x 3 = 2.7

0.02 x 3 = 0.06

Formal written short multiplication method: Decimal points line up under each other, zeros are added at place holders and the multiplier must be positioned in the correct place value column.

$$4.92 \times 3$$

	4	.	9	2	
x	3				
<hr/>					
	1	4	.	7	6
	1	2			

$$3.19 \times 8$$

	3	.	1	9	
x	8				
<hr/>					
	2	5	.	5	2
	2	5			