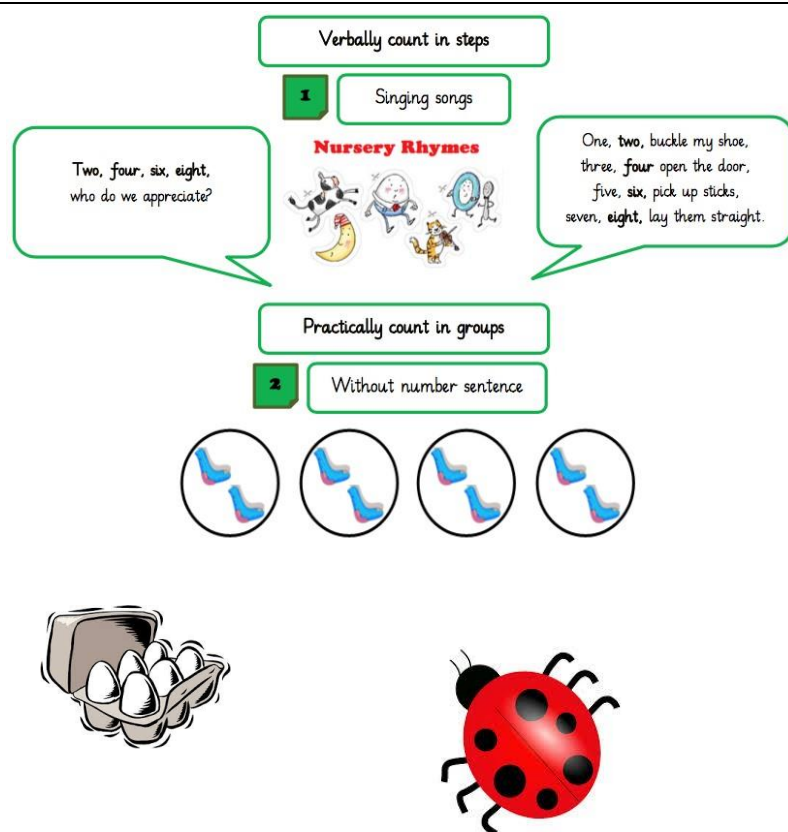


Foundation Stage 1 - Multiplication

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Birth to 11 months – notice changes in number of objects / images, sounds in groups of and up to 3.
- 8 to 20 months – has some understanding that things exist, even when they are out of sight.
- 16 to 26 months – Begins to organise and categorise objects (sorting).
- 22 to 36 months – knows that a group of things changes in quantity when something is added or taken away.
- 30 to 50 months – shows an interest in number problems.
- 40 to 60 months – counts objects to 10 and is beginning to count beyond 10.



Teaching points:

Use number lines 0 – 10.

Explore numbers in the environment, both inside and out.

Use a range of objects.

Model in role-play areas.

Start introducing the idea of doubling.

Key vocabulary

Group of, lots of, count.

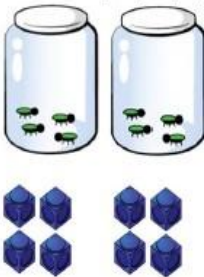
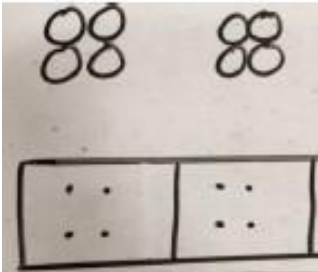
Foundation Stage 2 – Multiplication

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

Early Learning Goals:

- Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.
- Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.
- They solve problems that include doubling, halving and sharing.

Concrete	Pictorial
	<p style="font-size: small;">Children to represent the practical resources in a picture and use a bar model.</p> 

Varied approaches to include:


Practically count in groups and use pictorial representations

$2 \times 4 = 8$

1

Counting in steps

" 2, 4, 6, 8 "



2


Practically counting in groups

3

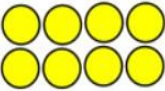
Drawing using arrays

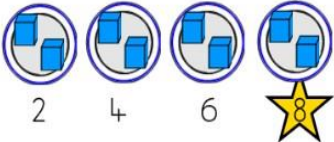
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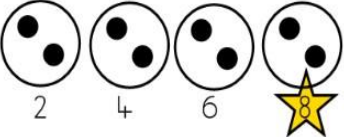
Drawing using symbols



OR







Teaching points:

Use number lines 0 – 10.

Explore numbers in the environment, both inside and out.

Sharing snacks to reinforce the idea of grouping.

Encourage children to draw or make arrays using counters.

Use a range of objects.

Model in role-play areas, including doubling.

Experience doubling in a variety of contexts.

Key vocabulary

Group of, lots of, count, **double**, **times**, **array**.

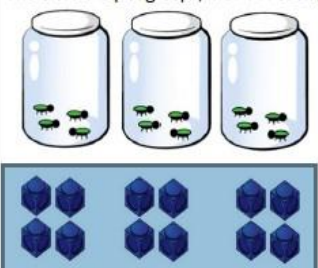
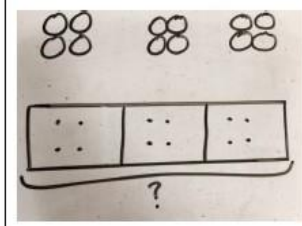
Year 1 – Multiplication

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Solve one-step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher.

Teaching points:

Concrete	Pictorial	Abstract
<p>Repeated grouping/repeated addition 3×4 $4 + 4 + 4$ There are 3 equal groups, with 4 in each group.</p> 	<p>Children to represent the practical resources in a picture and use a bar model.</p> 	<p>$3 \times 4 = 12$ $4 + 4 + 4 = 12$</p>

Ensure that pupils experience contextual links such as:

- Make connections between arrays and number patterns.
- Support problems using images.

Count in twos, fives and tens.



Key vocabulary (new words to year 1 are in red)

Group of, lots of, count, double, times, array, multiply, multiplied once, twice three times, four times, five times ... ten times, repeated addition, equal sets of.

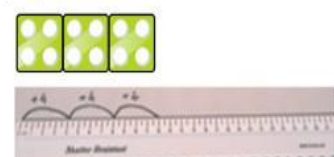
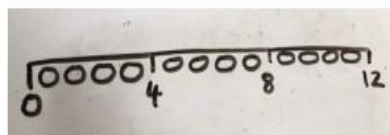

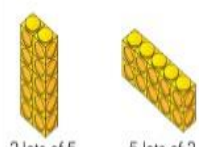
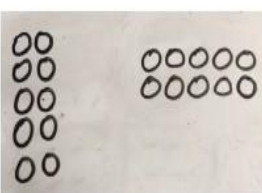
Year 2 - Multiplication

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers.
- Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (\times) and equals ($=$) signs.
- Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.
- Solve problems involving multiplication and division using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Teaching points:

Concrete	Pictorial	Abstract
<p>Number lines to show repeated groups- 3×4</p> 	<p>Represent this pictorially alongside a number line e.g.:</p> 	<p>Abstract number line showing three jumps of four.</p> <p>$3 \times 4 = 12$</p> 
<p>Use arrays to illustrate commutativity counters and other objects can also be used. $2 \times 5 = 5 \times 2$</p>  <p>2 lots of 5 5 lots of 2</p>	<p>Children to represent the arrays pictorially.</p> 	<p>Children to be able to use an array to write a range of calculations e.g.</p> <p> $10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$ </p>

Pupils explore, practically, commutative multiplication facts, showing that the same product is produced, e.g. $10 \times 5 = 50$ and $5 \times 10 = 50$

Pupils recall and use the 2x, 5x, 10x, begin to count in 3s and 4s and start to use doubling to progress onto 6x

Key vocabulary (new words to year 2 are in red)

Group of, lots of, count, double, times, array, multiply, multiplied once, twice three times, four times, five times ... ten times, repeated addition, **multiplication**.

Year 3 - Multiplication

Curriculum 2014 Statutory Requirements

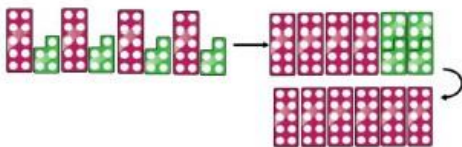
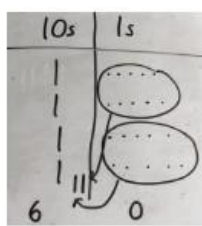
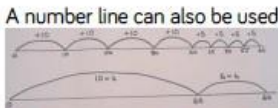

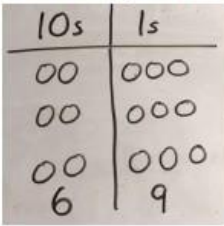
Pupils should be taught to:

- Recall and use multiplication facts for the 3, 4 and 8 multiplication tables.
- Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing number problems, involving multiplication and division, including positive number scaling problems and correspondence problems where 'n' objects are connected to 'm' objects.

Teaching points:

Pupils recall and use facts for:
2x, 5x, 10x, 3x, 4x, 6x 8x

Pupils build on their doubling skills of the 2x to find 4x then 4x to find 8x.

Concrete	Pictorial	Abstract								
<p>Partition to multiply using Numicon, base 10 or Cuisenaire rods.</p> <p>4×15</p> 	<p>Children to represent the concrete manipulatives pictorially.</p> 	<p>Children to be encouraged to show the steps they have taken.</p> <p>4×15</p> <p>$10 \times 4 = 40$ $5 \times 4 = 20$ $40 + 20 = 60$</p> <p>A number line can also be used</p> 								
<p>Formal column method with place value counters (base 10 can also be used.) 3×23</p> 	<p>Children to represent the counters pictorially.</p> 	<p>Children to record what it is they are doing to show understanding.</p> <p>3×23 $3 \times 20 = 60$ $20 \quad 3$ $3 \times 3 = 9$ $60 + 9 = 69$</p> <p>23 $\times 3$ $\hline 69$</p> <table><tr><td>x</td><td>3</td></tr><tr><td>20</td><td>60</td></tr><tr><td>3</td><td>9</td></tr><tr><td colspan="2"><hr/></td></tr></table>	x	3	20	60	3	9	<hr/>	
x	3									
20	60									
3	9									
<hr/>										

69

When calculating a question such as 43×2 , model and discuss appropriateness of the approach and refer to doubling. Progress and model doubling, and doubling again when finding 4x..

Key vocabulary (new words to year 3 are in red)

Group of, lots of, count, double, times, array, multiply, multiplied once, twice three times, four times, five times ... times, repeated addition, multiplication, **product**.

Year 4 - Multiplication

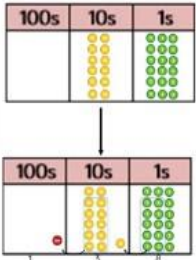
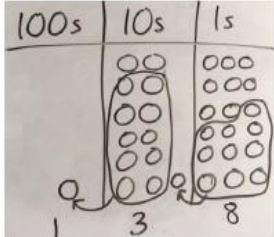
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Recall multiplication and division facts for multiplication tables up to 12×12 .
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers.
- Recognise and use factor pairs and commutativity in mental calculations.
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.
- Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as 'n' objects are connected to 'm' objects.

Teaching points:

Pupils recall and use table facts up to 12×12

Concrete	Pictorial	Abstract
<p>Formal column method with place value counters.</p> <p>6×23</p> 	<p>Children to represent the counters/base 10, pictorially e.g. the image below.</p> 	<p>Formal written method</p> <p>$6 \times 23 =$</p> $\begin{array}{r} 23 \\ \times 6 \\ \hline 138 \end{array}$

Expanded column multiplication

1

TO x O with brackets

	3	4							
x			3						
<hr/>									
		1	2	(4 x 3)					
		9	0	(30 x 3)					
<hr/>									
		1	0	2					

2

TO x O

	3	4							
x			3						
<hr/>									
		1	2						
		9	0						
<hr/>									
		1	0	2					

3

HTO x O

		2	3	4					
x				3					
<hr/>									
			1	2					
			9	0					
<hr/>									
			1	0	2				

4

HTO x O

		2	3	4					
x				3					
<hr/>									
			7	0	2				

5

HTO x O

6

HTO x O

7

HTO x O

8

HTO x O

9

HTO x O

10

HTO x O

11

HTO x O

12

HTO x O

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HTO x O

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HTO x O

52

HTO x O

53

HTO x O

54

HTO x O

Small steps to achieving a written method:

Key vocabulary (new words to year 4 are in red)

Group of, lots of, count, double, times, array, multiply, multiplied once, twice three times, four times, five times ... ten times, repeated addition, multiplication, product.

Year 5 - Multiplication

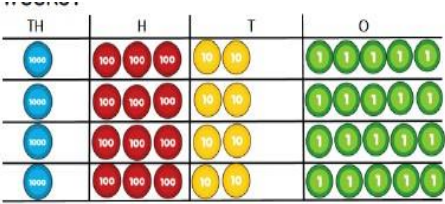
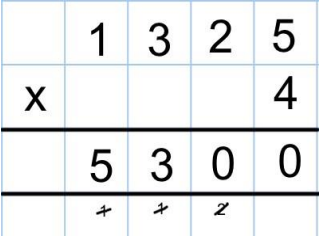
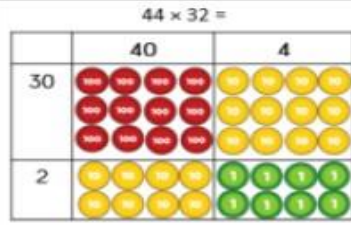
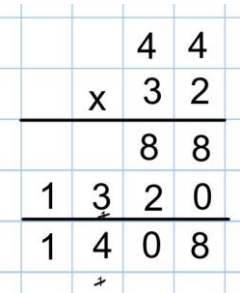
Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Identify multiples and factors: all factor pairs of a number, common factors of two numbers, establish whether a number up to 100 is prime and recall prime numbers up to 19.
- Multiply numbers up to four digits by a one- or two-digit number using a formal written method.
- Multiply whole numbers and those involving decimals by 10, 100 and 1000.
- Solve problems involving multiplication and division, including using their knowledge of factors and multiples, squares and cubes.

Teaching points:

Children build on their understanding of short multiplication to use long multiplication to multiply by 2 digit numbers. Understanding should continue to be develop using concrete and pictorial approaches.

Concrete/ Pictorial approaches	Alongside abstract
	
	

Children begin to use their understanding to multiply decimal numbers within the context of money. Use coins to support children's understanding.

Key vocabulary (new words to year 5 are in red)

Group of, lots of, count, double, times, array, multiply, multiplied once, twice three times, four times, five times ... ten times, repeated addition, multiplication, product.

Year 6 - Multiplication

Curriculum 2014 Statutory Requirements

Pupils should be taught to:

- Identify multi-digit numbers up to 4 digits by a two-digit number using formal, long multiplication.
- Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.
- Identify common factors, common multiples and prime numbers.
- Solve problems involving addition, subtraction, multiplication and division.

Children progress to multiplying decimals by a whole number and decimals by decimals. Manipulatives should still be used to support understanding, as suggested in Year 5.

1 Short column multiplication

Multiplying an integer by a decimal

	1	3	8	5
x			5	
<hr/>				
	6	9	2	5

Context of money
e.g. £13.85 x 5 = **£69.25**

2 Long column multiplication

THHTO x TO

	2	5	6	4
x			2	3
<hr/>				
	7	6	9	2
5	1	2	8	0
<hr/>				
5	8	9	7	2

Cross out once used!

3 Decimal x TO

		2	4	9
x	2	4		
<hr/>				
	9	9	6	
4	9	8	0	
<hr/>				
5	9	7	6	

4 Decimal x decimal, e.g. 2.49 x 4.3

Take decimal points out

Multiply

Count total decimal places from original numbers

Add decimal point back in

	2	4	9	
x		4	3	
<hr/>				
	7	4	7	
9	9	6	0	
<hr/>				
1	0	7	0	7

2.49 x 4.3 (3d.p.) 10.707

My answer should be around 600 as I know that 20 x 30 = 600.

Teaching points:

Children should be exposed to regular tables practise and recall associated facts.

Children should know how to use multiplication as the inverse of division to check answers.

Children should progress onto finding missing numbers in calculations.

Children should use rounding to estimate answers.

Children should be exposed to multiplication problems in a variety of life contexts.

Key vocabulary (new words to year 6 are in red)

Group of, lots of, count, double, times, array, multiply, multiplied once, twice three times, four times, five times ... ten times, repeated addition, multiplication, product, **long multiplication**, **short multiplication**.