LANE END CALCULATION POLICY

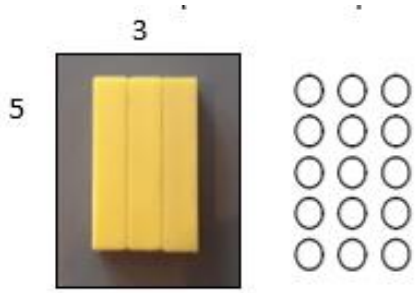
MULTIPLICATION

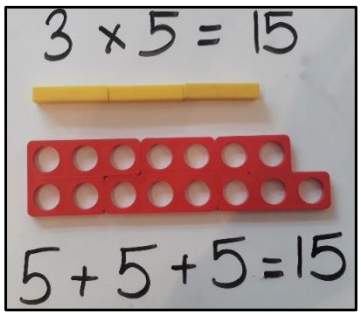
This section of the policy is divided into 2 parts; the first part shows the representations and models to use for each times table plus what to ensure the children look out for and learn in order to help them to learn these tables by heart. The second part details each skill plus the representations and models we will use to teach the skills.

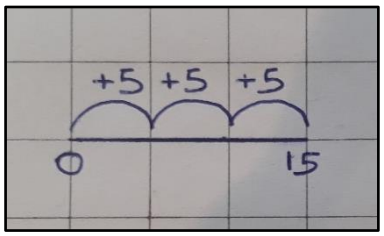
We follow a Concrete Pictorial Abstract approach to mathematical learning and children work through each stage before moving on to more formal written methods. Models, images and resources are selected carefully to best teach concepts and structures. We recognise that all children work through this approach.

In addition to the representations detailed below each times table, children will recognise multiplication as repeated addition and will picture this as arrays.


3 + 3 + 3 + 3 + 3 OR 5 + 5 + 5 = 15





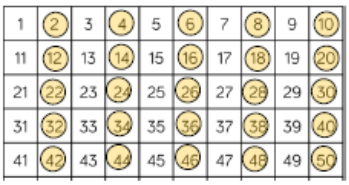


Part 1

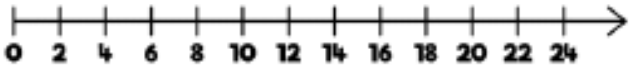
Year 2

2 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.







Look for patterns in the 2 times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones.

Repeated Addition: Practical Multiplication

Children need plenty of experience of multiplying using repeated addition with concrete objects and pictorial representations.

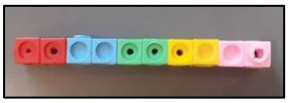
Give children plenty of opportunities to count in equal groups.

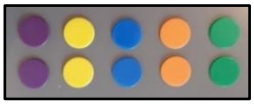
Give children plenty of problem solving activities involving counting equal sets or groups.

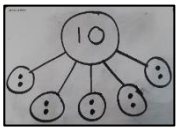










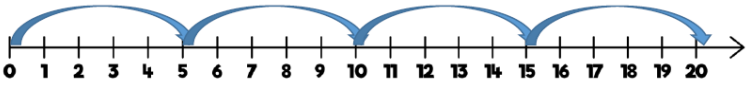


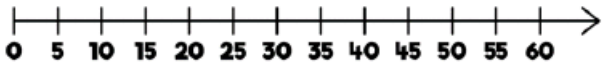
Year 2

5 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50





Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

Repeated Addition: Practical Multiplication

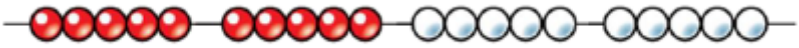
Children need plenty of experience of multiplying using repeated addition with concrete objects and pictorial representations.

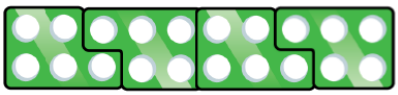
Give children plenty of opportunities to count in equal groups.

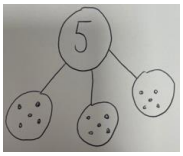
Give children plenty of problem solving activities involving counting equal sets or groups.











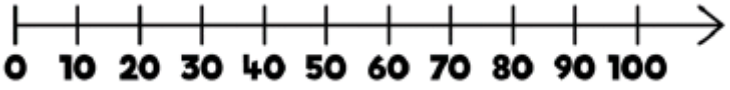


Year 2

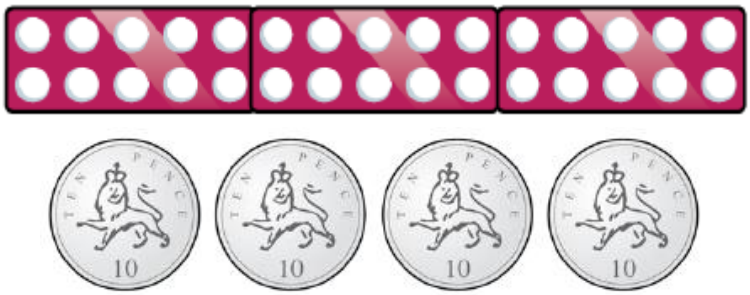
10 times table

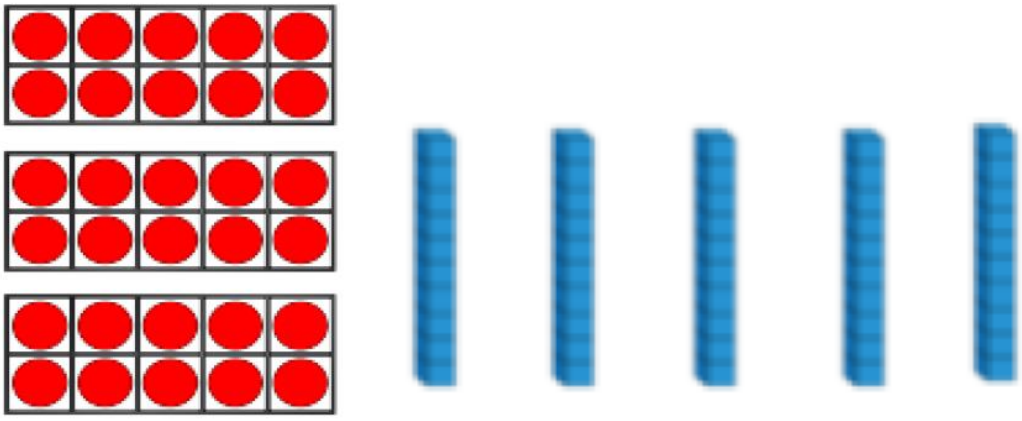
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits – the ones are always 0, and the tens increase by 1 each time.





Repeated Addition: Practical Multiplication

Children need plenty of experience of multiplying using repeated addition with concrete objects and pictorial representations.

Give children plenty of opportunities to count in equal groups.

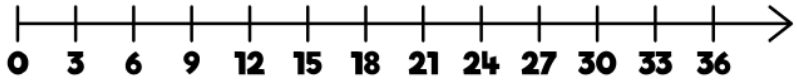
Give children plenty of problem solving activities involving counting equal sets or groups.

Year 3

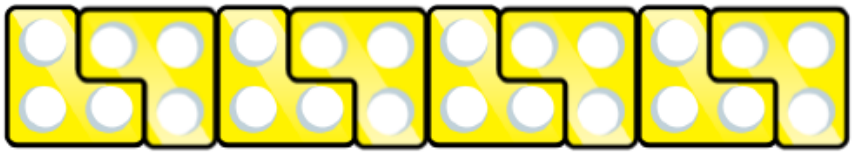
3 times table

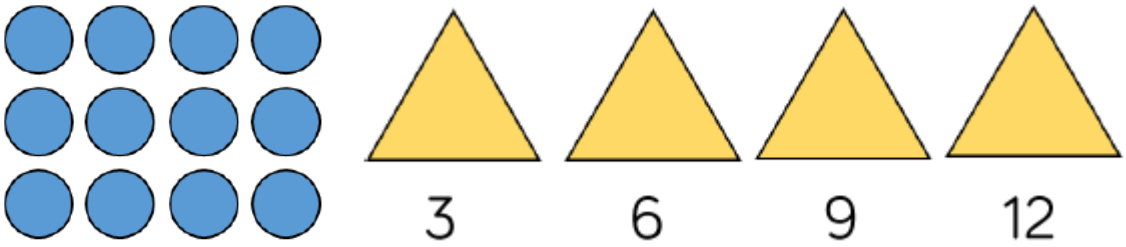
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



Look for patterns in the 3 times table, using concrete manipulatives to support. Notice the odd, even, odd, even patterns using number shapes to support. Highlight the patterns in the ones using the 100 square.





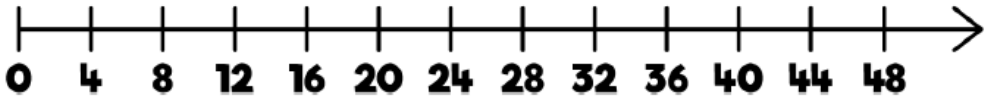


Year 3

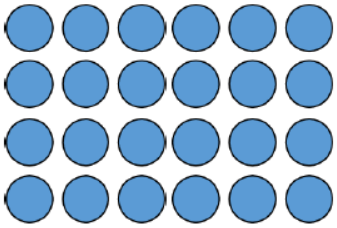
4 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

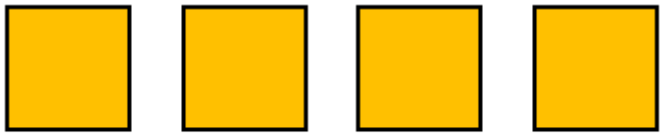


Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.





4	8	12	16	20
24	28	32	36	40
44	48	52	56	60



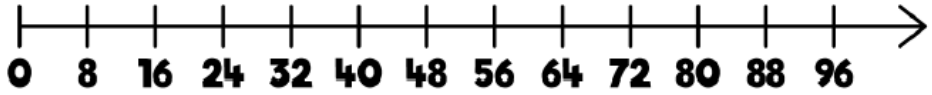
4 8 12 16

Year 3

8 times table

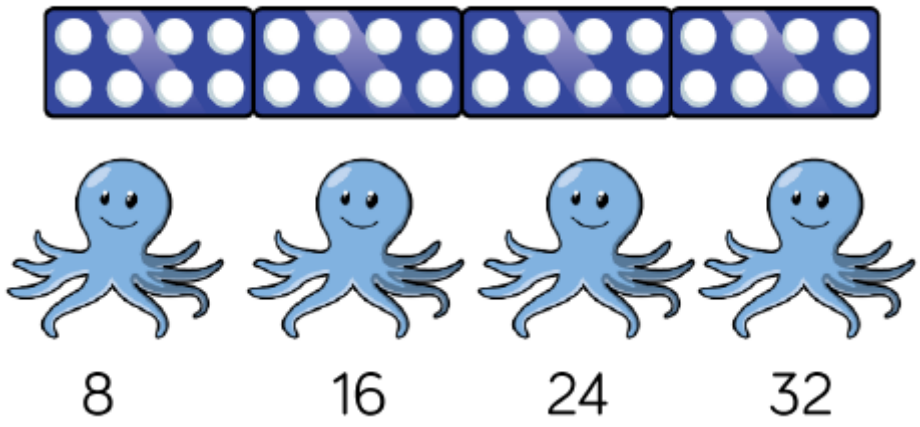
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiples is double the fours. Notice the pattern in the ones within each group of five multiples.

Highlight that all the multiples are even using number shapes to support.



8	16	24	32	40
48	56	64	72	80

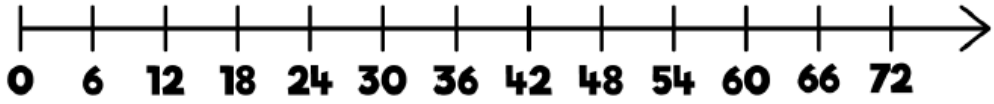


Year 4

6 times table

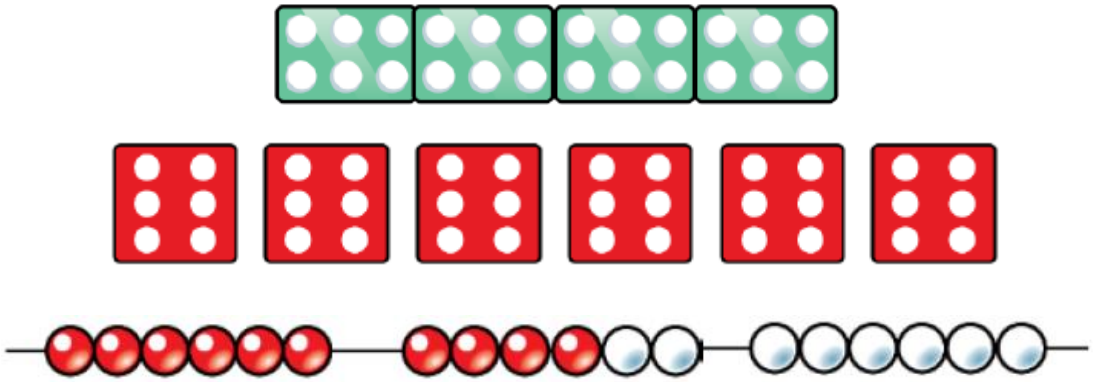
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Look for patterns in the six times table, using manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples.

Highlight that all the multiples are even using number shapes to support.



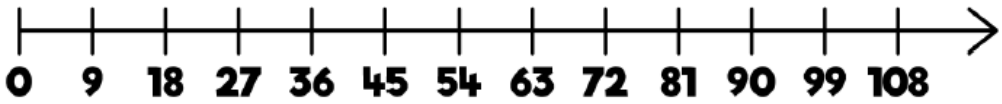
6	12	18	24	30
36	42	48	54	60
66	72	78	84	90

Year 4

9 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd, even pattern within the multiples.



9	18	27	36	45
54	63	72	81	90

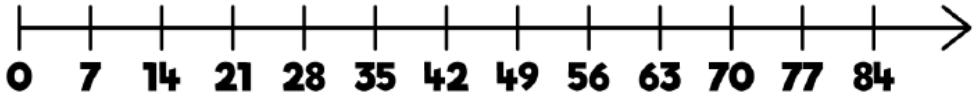


Year 4

7 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



The seven times table can be trickier due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity.
Children can still see the odd, even pattern in the multiples using number shapes to support.



7	14	21	28	35
42	49	56	63	70

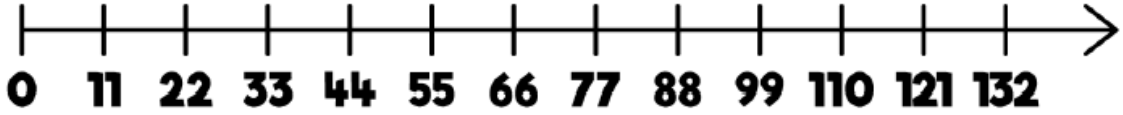


Year 4

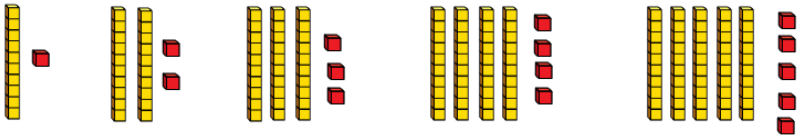
11 times table

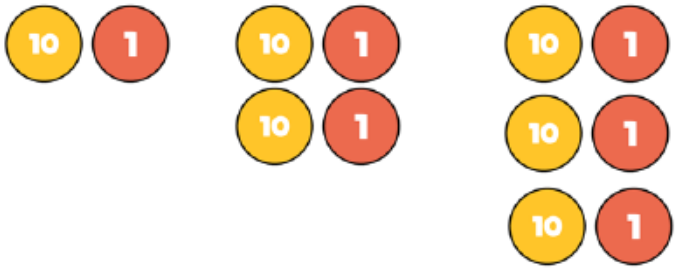
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Look for patterns in the eleven times table, using concrete manipulatives to support. Notice the tens and ones using the hundred square to support. Also consider the pattern after crossing 100.





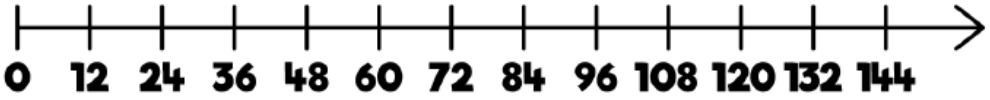
11	22	33	44	55	66
77	88	99	110	121	132

Year 4

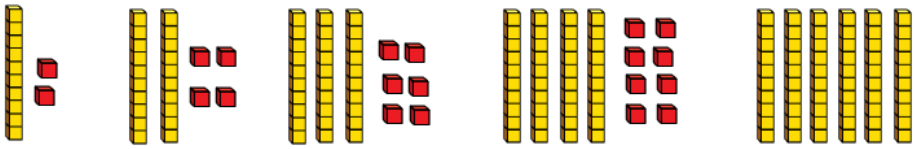
12 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

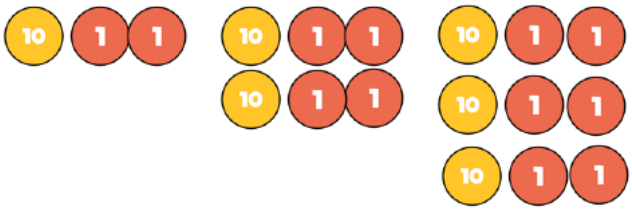
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



Look for patterns in the 12 times table, using manipulatives to support. Make links to the 6 times table, seeing how each multiple is double the sixes. Notice the pattern in the ones within each group of five multiples. The hundred square can support in highlighting this pattern.



12	24	36	48	60
72	84	96	108	120
132	144			



Part 2

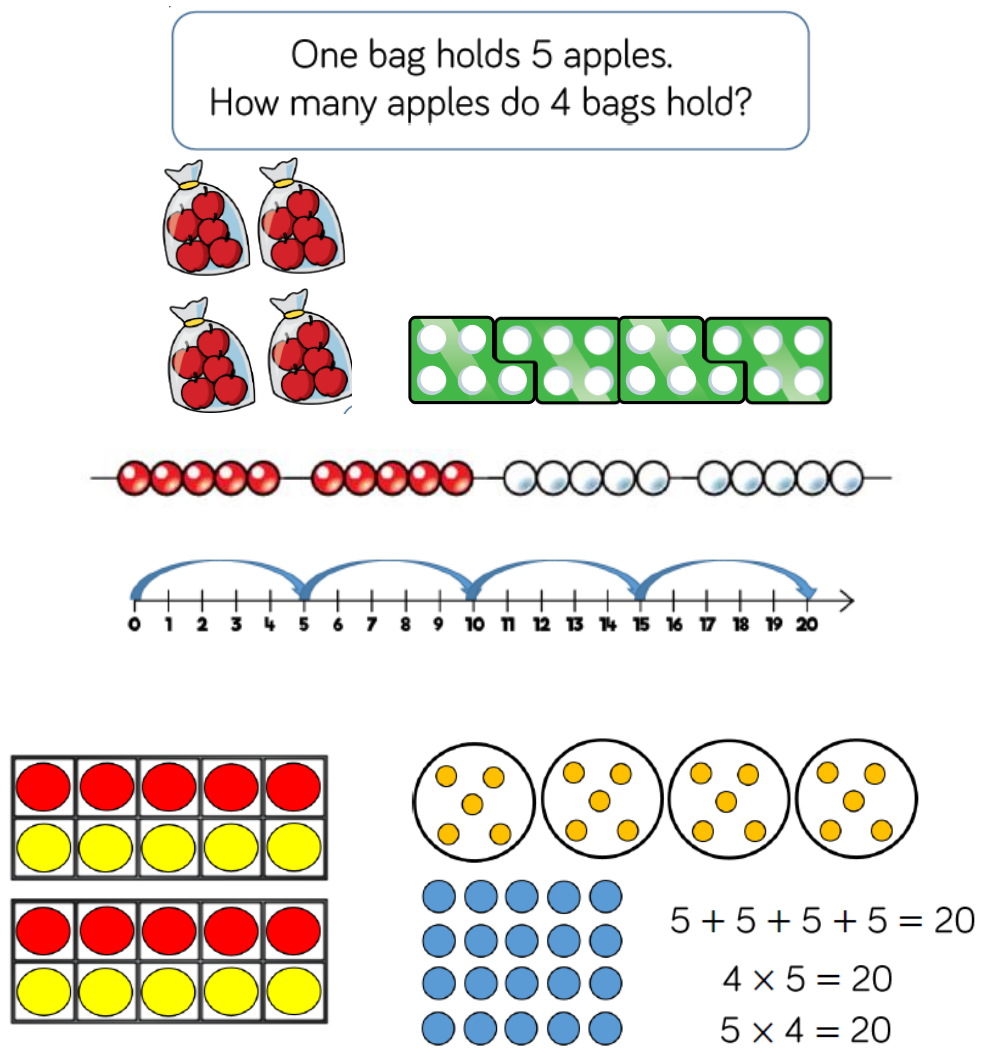
Year 1/2

Skill: Solve 1-step problems using multiplication

Children represent multiplication as repeated addition in many different ways.

In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.

In Year 2, children are introduced to the multiplication symbol.



Year 3/4

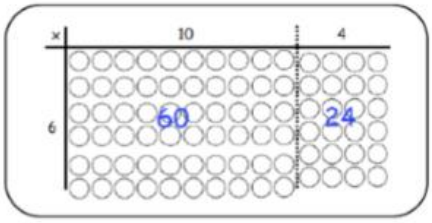
Skill: Multiply 2-digit numbers by 1-digit numbers

Children must be familiar with multiplying numbers by a power of 10
e.g. I know 3 x 4 = 12 so I know that 30 x 4 = 120

Grid Method – the children will be taught this method before moving on to any column multiplication methods

1. Explain that we will partition the 2-digit number into tens and ones to multiply by the 1-digit number. This can be represented using an array set out in a grid method format (this representation is called the area model). The children will need to be familiar with this format before moving on to the next step.

14 x 6



2. At this next stage the children will move towards representing the multiplication like this:

14 x 6 = 84

x	10	4
6	60	24

Ensure children are secure with a method to add the two numbers together and use this consistently and reliably. e.g.

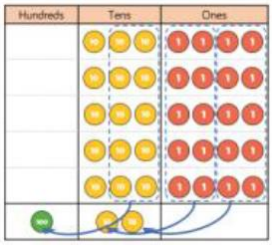
	6	0
+	2	4
	8	4

Column Method

1. Begin with the expanded column method before coming on to the compact column method to multiplicate.

	H	T	O		
		3	4		
×			5		
		2	0	(5 × 4)	
+	1	5	0	(5 × 30)	
	1	7	0		

2. Then move to the compact column method. Place value counters and Base 10 should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge. Always show the calculation alongside the representation and model.



	H	T	O	
		3	4	
×			5	
	1	7	0	
	1	2		

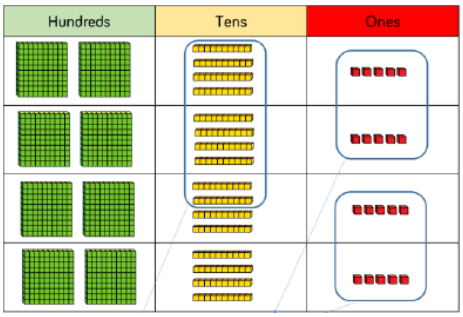
Year 3/4

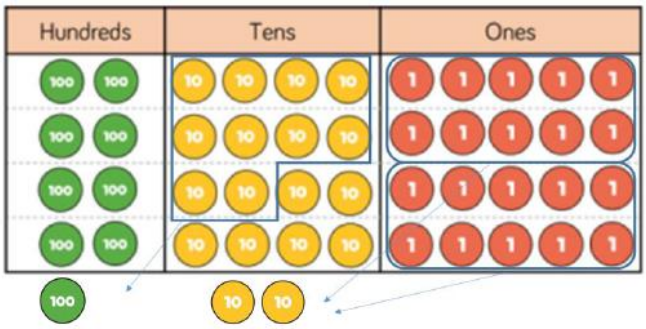
Skill: Multiply 3-digit numbers by 1-digit numbers

When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method.

Base 10 and place value counters continue to support the understanding of the written method. Limit the number of changes needed in the questions and move children away from resources when multiplying larger numbers.

$$245 \times 4 = 980$$





	H	T	O
	2	4	5
×			4
	9	8	0
	1	2	

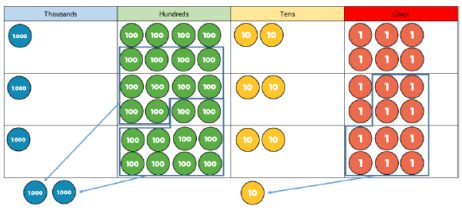
Year 5

Skill: Multiply 4-digit numbers by 1-digit numbers

When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method.

If children are multiplying larger numbers and are struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.

$$1{,}826 \times 3 = 5{,}478$$



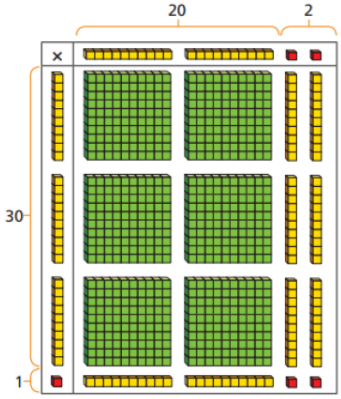
	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

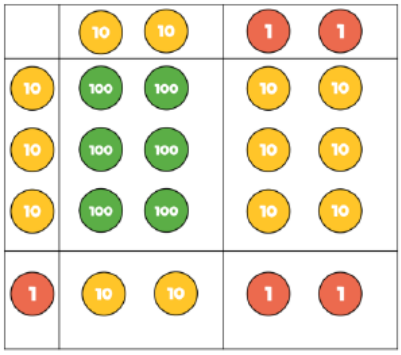
Year 5

Skill: Multiply 2-digit numbers by 2-digit numbers

When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the space covered by the Base 10.

The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.





Once the area models above have been used to show children what they are multiplying then move on to the grid method as shown below. Children to add the numbers using column addition.

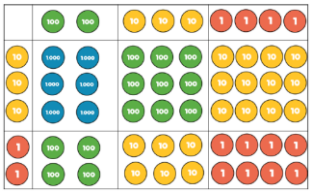
×	20	2
30	600	60
1	20	2

Year 5

Skill: Multiply 3-digit numbers by 2-digit numbers

Children can continue to use the area model when multiplying 3-digtis by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers. Encourage children to move towards the formal written method, seeing the links with the grid method.

$$234 \times 32 = 7{,}488$$



×	200	30	4
30	6,000	900	120
2	400	60	8

Th	H	T	O
	2	3	4
×		3	2
	4	6	8
^{1}	^{1}7	^{1}0	2	0
7	4	8	8

Year 5/6

Skill: Multiply 4-digit numbers by 2-digit numbers

When multiplying 4-digits by 2-digits, children should be confident in the written method.

If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Consider where exchanged digits are placed and make sure this is consistent.

$$2{,}739 \times 28 = 76{,}692$$

TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 (2)	1 (5)	9 (3)	1 (7)	2
5 (1)	4	7 (1)	8	0
7	6	6	9	2
		1		