Elburton Primary School

Multiplication & Division
Calculation Policy

Date	Description
October 2022	Policy Agreed
July 2024	Policy Review Date
Date	**Description**

Time Tables Learning Schedule

Skill	Year	Representations & Models	
Recall and use multiplication and division facts for the 2-times table	2	Bar Model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 5-times table	2	Bar Model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 10-times table	2	Hundred square Number shapes Counters Money	Ten frames Bead strings Number lines Base 10
Recall and use multiplication and division facts for the 3-times table	2/3	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 4-times table	3	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 8-times table	3	Hundred square Number shapes	Bead strings Number tracks Everyday objects
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes	Bead strings Number tracks Everyday objects
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 11-times table	4	Hundred square Base 10	Place value counters Number lines
Recall and use multiplication and division facts for the 12-times table	4	Hundred square Base 10	Place value counters Number lines

Nb. EYFS and Year 1 children will also learn to count in 2's, 10's and 5's (Year 1) to demonstrate repeated addition of the multiplication facts.

Examples of representations and manipulatives that could be used to teach the relevant times tables

Skill: 2 times table

Skill: 5 times table

Skill: 10 times table

Skill: 3 times table

Skill: 4 times table

Skill: 8 times table

Skill: 6 times table

Skill: 9 times table

Skill: 7 times table

7	14	21	28	35
42	49	56	63	70

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	㊻	57	58	59	60
61	62	㊿	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

0 7 14 21 28 35 42 49 56 63 70 77 84

Skill: 11 times table
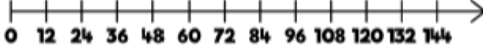
11	22	33	44	55	66
77	88	99	110	121	132

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	㊺	45	46	47	48	49	50
51	52	53	54	㊻	56	57	58	59	60
61	62	63	64	65	㊺	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

0 11 22 33 44 55 66 77 88 99 110 121 132

Skill: 12 times table

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

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	㊿
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

0 12 24 36 48 60 72 84 96 108 120 132 144

Early Years Multiplication

Introduce the link between addition and multiplication through doubling.

Double 2
2 + 2 = 4

Use Numicon to visualise the repeated adding of the same number. (These might be drawn around or printed as a way of recording.)
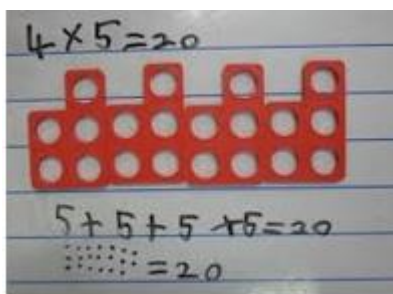
Use real life contexts and use of practical equipment to count in repeated groups of the same size. How many fingers on two hands? How many legs on four ducks?
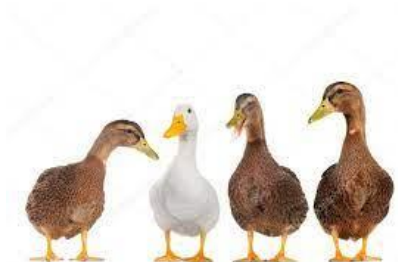
Skill	Year	Representations & Models	
Solve one-step problems with multiplication	1/2	Bar model Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1-digit numbers	3/4	Place value counters Base 10	Expanded written method Short written method
Multiply 3-digit by 1-digit numbers	4	Place value counters Base 10	Short written method
Multiply 4-digit by 1-digit numbers	5	Place value counters	Short written method
Multiply 2-digit by 2-digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3-digit numbers	5	Place value counters	Short written method Grid method
Multiply 2-digit by 4-digit numbers	5/6	Formal written method	

Solve 1-step problems using multiplication

Year 1 and 2

One bag holds 5 apples.
How many apples do 4 bags hold?

$$5 + 5 + 5 + 5 = 20$$
$$4 \times 5 = 20$$
$$5 \times 4 = 20$$
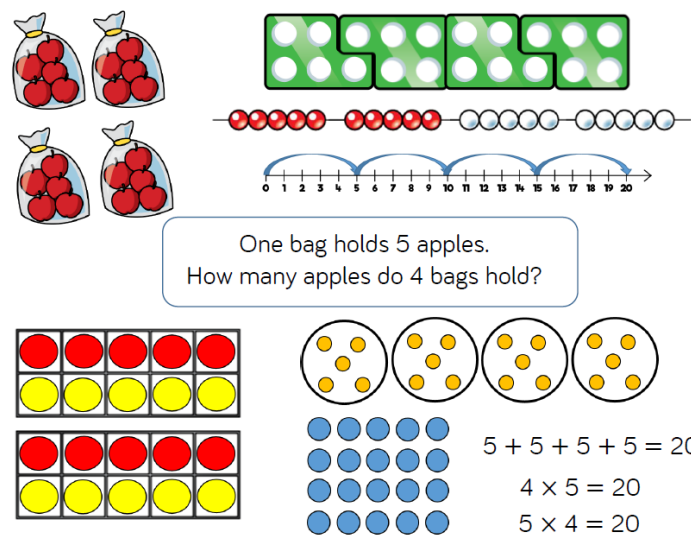
Children represent multiplication as repeated addition in many different ways.

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 more formally to the multiplication symbol.

Multiply 2-digit numbers by 1-digit numbers

Year 3 and 4

$$34 \times 5 = 170$$
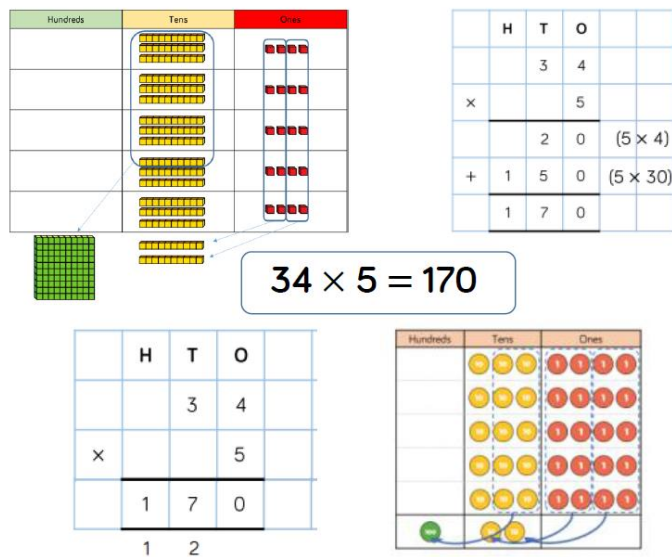
Multiply 3-digit numbers by 1-digit number

Year 4

$$245 \times 4 = 980$$
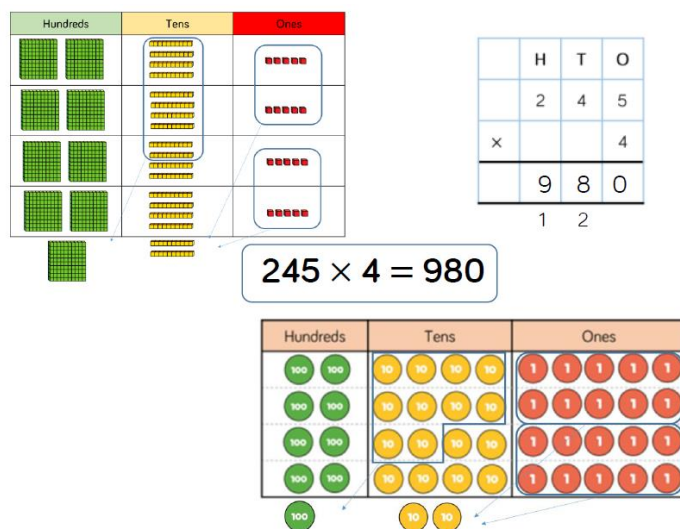
When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method. Base 10 and place value counters continue to support the understanding of the written method.

Multiply 4-digit numbers by 1-digit numbers

Year 5

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

	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	
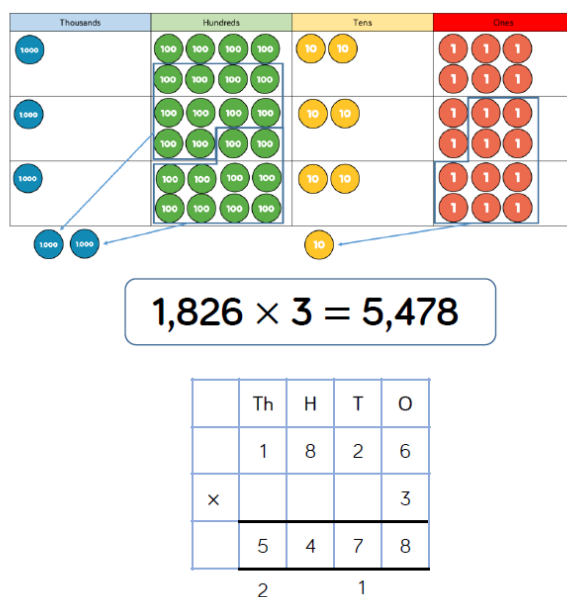
If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.

Multiply 2-digit numbers by 2-digit numbers

Year 5

×	20	2
30	600	60
1	20	2

	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

$$22 \times 31 = 682$$
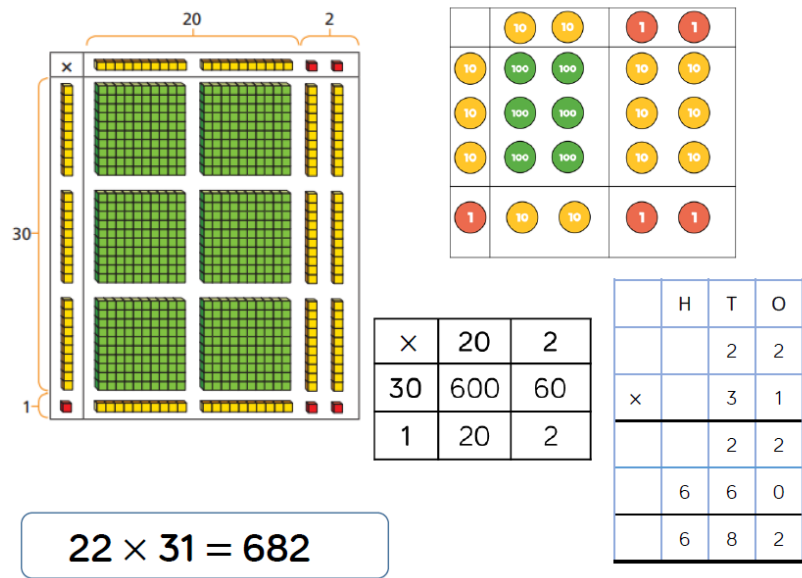
The grid method matches the area model as an initial written method and may be used before moving on to the formal written multiplication method.

Multiply 3-digit numbers by 2-digit numbers

Year 5

Th	H	T	O
		2	3	4
×			3	2
		4	6	8
₁7	₁0	2	0
7	4	8	8

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

$$234 \times 32 = 7,488$$
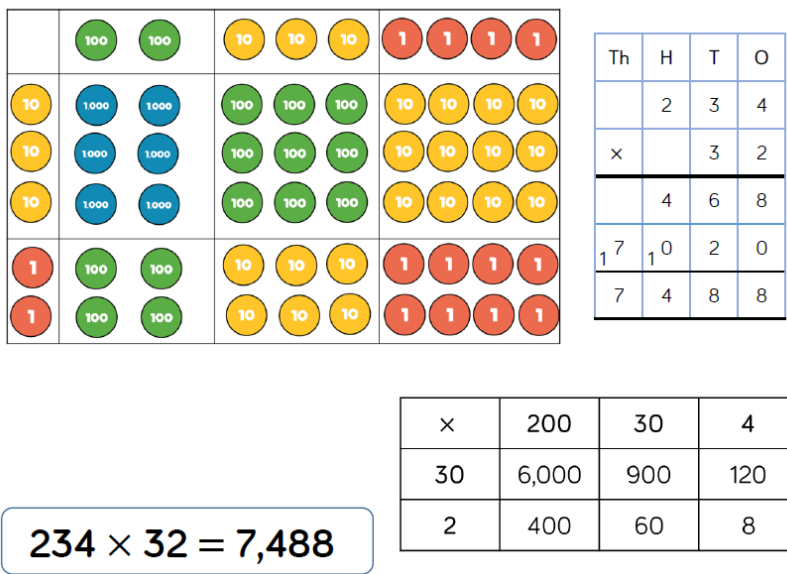
Children should now move towards the formal written method, seeing the links with the grid method.

Multiply 4-digit numbers by 2-digit numbers.

Year 5 and 6

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		

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

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

Early Years Division

Introduce division through halving; use practical resources and models to support this. Begin with mostly pictorial representations linked to real life contexts.

Children need to see and hear representations of halving as <u>sharing</u>. I have 10 apples. I want to share them with my friend. How many will we have each?
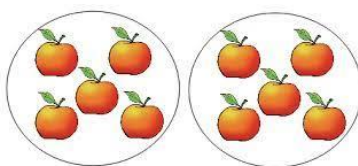
Key Stage 1 & 2 – Division Skills

Skill	Year	Representations & Models	
Solve one-step problems with division (sharing)	1/2	Bar Model Real life objects	Arrays Counters
Solve one-step problems with division (sharing)	1/2	Real life objects Number shapes Bead strings Ten frames	Number lines Arrays Counters
Divide 2-digits by 1-digit (no exchange sharing)	3	Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (sharing with exchange)	3	Base 10 Bar model	Place value counters Part-whole model Written short division
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 3-digits by 1-digit (sharing with exchange)	4	Base 10 Bar model	Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 4-digits by 1-digit (grouping)	5	Place value counters Counters	Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division	List of multiples
Divide multi-digits by 2-digits (long division)	6	Written short division	List of multiples

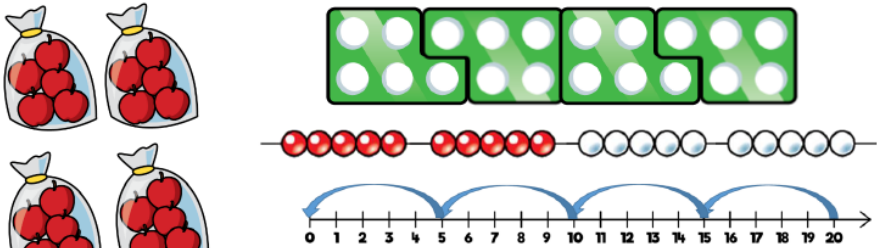**Solve 1-step problems using multiplication (sharing)**

Year 1 and 2

20
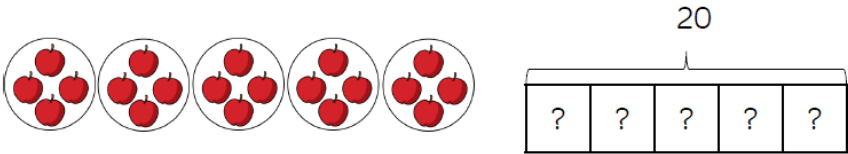
There are 20 apples altogether.
They are shared equally between 5 bags.
How many apples are in each bag?
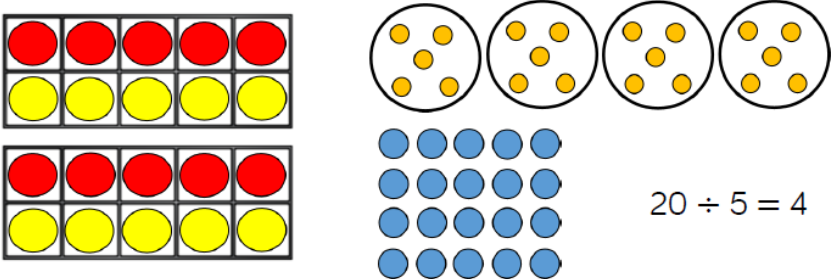
$20 \div 5 = 4$
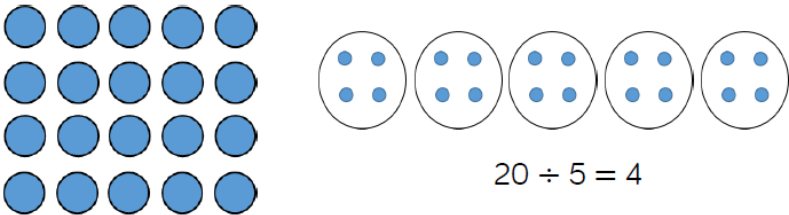
Children are introduced to the division symbol in Year 2.

Solve 1-step problems using multiplication (grouping)

Year 1 and 2

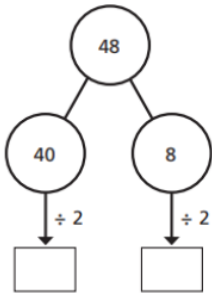There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?

$20 \div 5 = 4$

Divide 2-digit by 1-digit (sharing no exchange)

Year 3 and 4

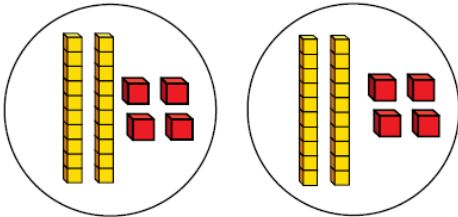| Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1

$$48 \div 2 = 24$$

48
40   8
÷ 2   ÷ 2

Divide 2-digit by 1-digit (sharing with exchange)

Year 3 and 4

Tens	Ones

52
? ? ? ?

$$52 \div 4 = 13$$

52
40   12
÷ 4   ÷ 4
10   3
$$10 + 3 = 13$$
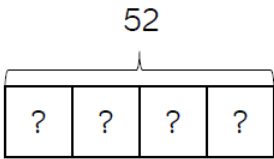
Tens	Ones
10	1 1 1
10	1 1 1
10	1 1 1
10	1 1 1
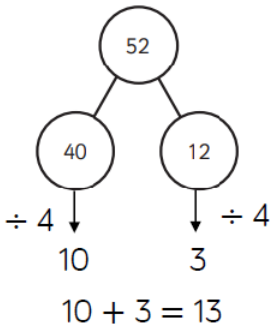
Divide 2-digit by 1-digit (sharing with remainders)

Year 3 and 4

$$53 \div 4 = 13 \text{ r}1$$
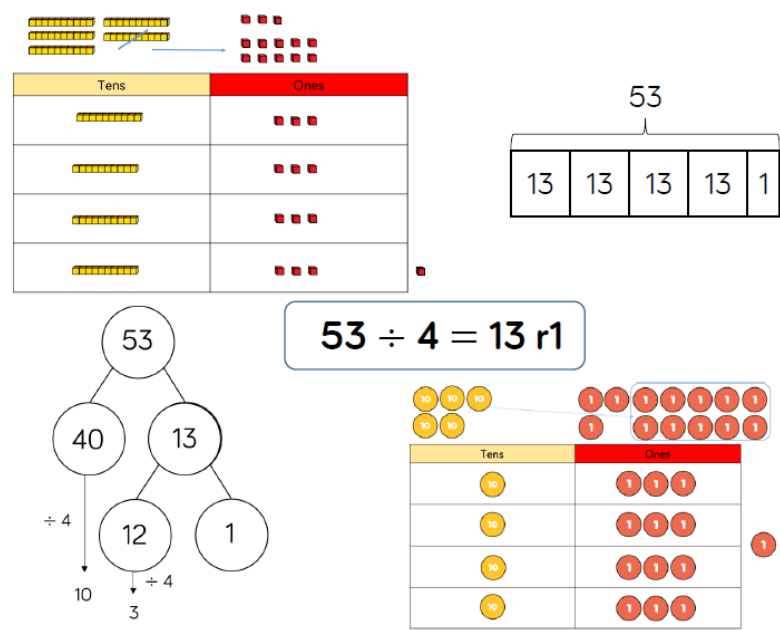
Children will also be introduced to the short division method when it is deemed appropriate that they have grasped the above strategies for division.
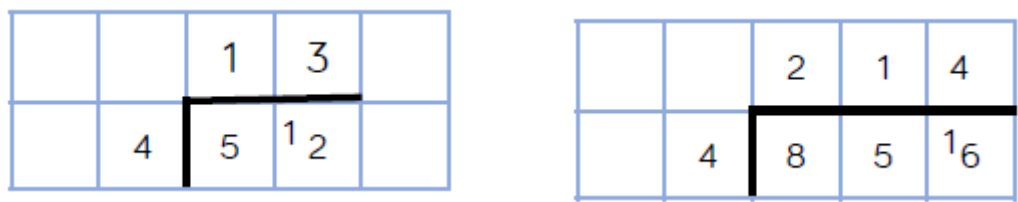
Divide 2-digits by 1-digit (grouping)

Year 3, 4 and 5

$$52 \div 4 = 13$$

Divide 3-digits by 1-digit (sharing)

Year 4 and 5

$$844 \div 4 = 211$$

844

	H	T	O
	100 100	10	1
	100 100	10	1
	100 100	10	1
	100 100	10	1

844
800   40   4
÷ 4   ÷ 4   ÷ 4

$$856 \div 4 = 214$$

856
800   40   16
÷ 4   ÷ 4   ÷ 4
200   10   4

Hundreds	Tens	Ones
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1

Hundreds	Tens	Ones
100 100 100 100	10 10 10 10	1 1 1 1
100 100 100 100	10	1 1 / 1 1 1 1 / 1 1 1 1 / 1 1

		2	1	4
	4	8	5	¹6

Hundreds	Tens	Ones

$$856 \div 4 = 214$$
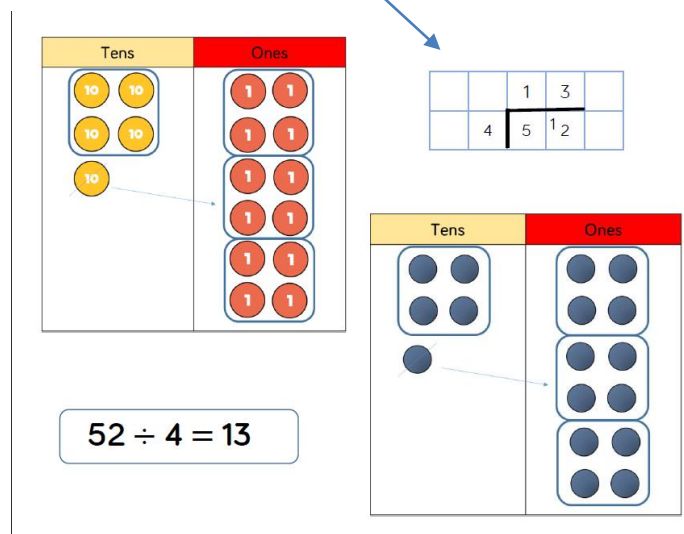
Divide 4-digits by 1-digit
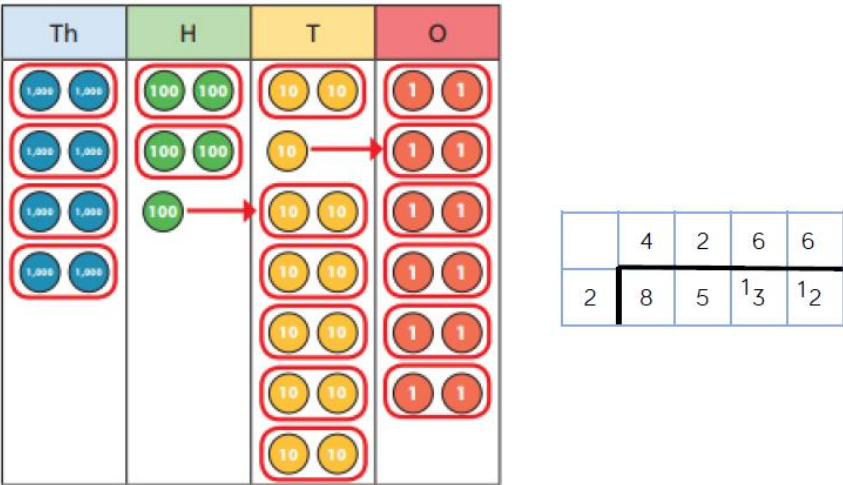
Year 5

		4	2	6	6
	2	8	5	$^{1}3$	$^{1}2$

$$8{,}532 \div 2 = 4{,}266$$

Children should be encouraged to move away from manipulatives and counters when they are ready to do so.

Divide multi-digits by 2-digits (Short division)

Year 5 and 6

		0	3	6
	12	4	4_{3}	7_{2}

$$432 \div 12 = 36$$

$$7{,}335 \div 15 = 489$$

		0	4	8	9
	15	7	7_{3}	$^{13}3$	$^{13}5$

15	30	45	60	75	90	105	120	135	150

Year 6

		0	3	6
1	2	4	3	2
	−	3	6	0
			7	2
	−		7	2
				0

(×30)
(×6)

$12 \times 1 = 12$
$12 \times 2 = 24$
$12 \times 3 = 36$
$12 \times 4 = 48$
$12 \times 5 = 60$
$12 \times 6 = 72$
$12 \times 7 = 84$
$12 \times 8 = 96$
$12 \times 7 = 108$
$12 \times 10 = 120$

$$432 \div 12 = 36$$

		0	4	8	9
15	7	3	3	5	
−	6	0	0	0	
	1	3	3	5	
−	1	2	0	0	
		1	3	5	
−		1	3	5	
				0	

(×400
(×80)
(×9)

$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

$$7{,}335 \div 15 = 489$$

		2	4	r	1	2
1	5	3	7	2		
	−	3	0	0		
			7	2		
	−		6	0		
			1	2		

$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

$$372 \div 15 = 24\ r12$$

		2	4	$\frac{4}{5}$
1	5	3	7	2
	−	3	0	0
			7	2
	−		6	0
			1	2

$$372 \div 15 = 24\frac{4}{5}$$

Children will be encouraged to use a help box to support counting in larger numbers. For eg, when dividing by 36

30	+	6	=	36
60	+	12	=	72
90	+	18	=	108
120	+	24	=	144
150	+	30	=	180
180	+	36	=	216

Children will also be encouraged to express their answers as remainders, fractions and decimals when capable of grasping the concept.