Rimrose Hope C of E Primary School
Calculation Policy: Multiplication and division

(Adapted from White Rose)

Year 1 - 6

Calculation Policy
Multiplication and Division

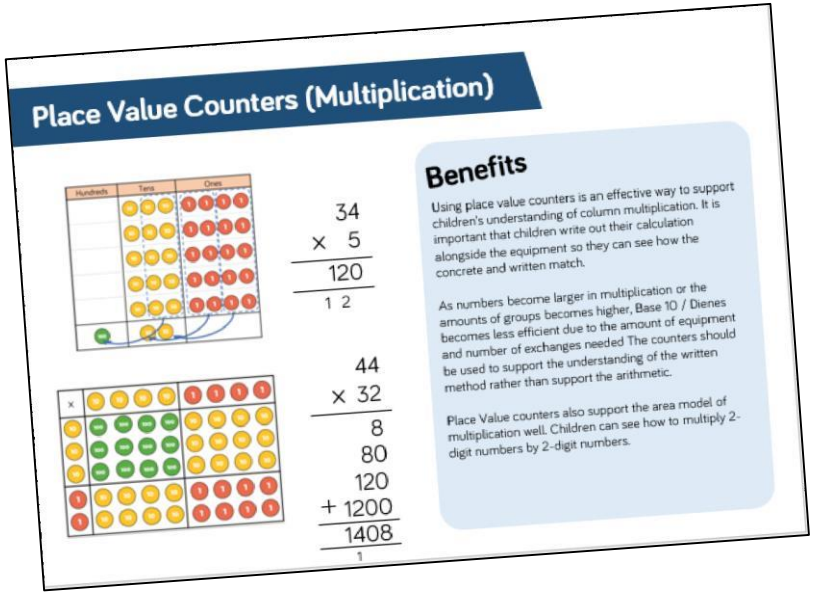
#MathsEveryoneCan

Calculation Policy

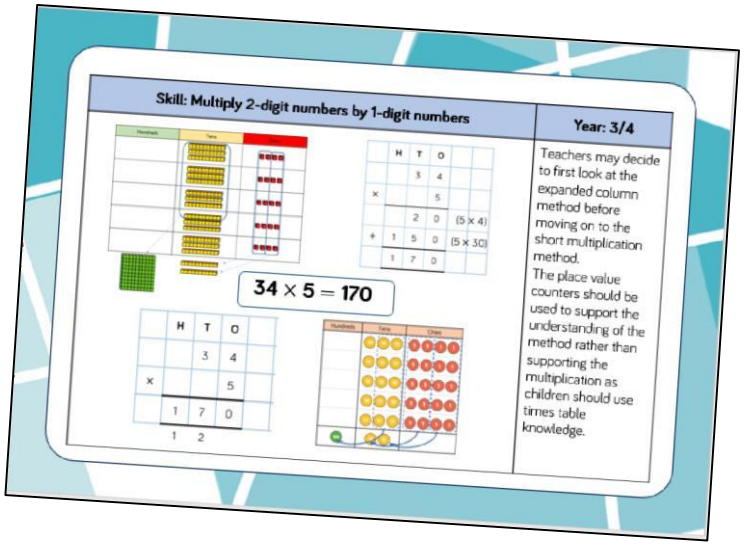
Welcome to the White Rose Maths Calculation Policy.

This document is broken down into addition and subtraction, and multiplication and division.

At the start of each policy, there is an overview of the different models and images that can support the teaching of different concepts. These provide explanations of the benefits of using the models and show the links between different operations.



Each operation is then broken down into skills and each skill has a dedicated page showing the different models and images that could be used to effectively teach that concept.



There is an overview of skills linked to year groups to support consistency through out school. A glossary of terms is provided at the end of the calculation policy to support understanding of the key language used to teach the four operations.

Bead Strings

Year 2 curriculum only

Suitable for 2s, 5s and 10s.

$5 \times 3 = 15$ $15 \div 3 = 5$

(grouping)

$3 \times 5 = 15$ $15 \div 5 = 3$

(grouping)

$5 \times 4 = 20$ $20 \div 4 = 5$

(grouping)

Benefits

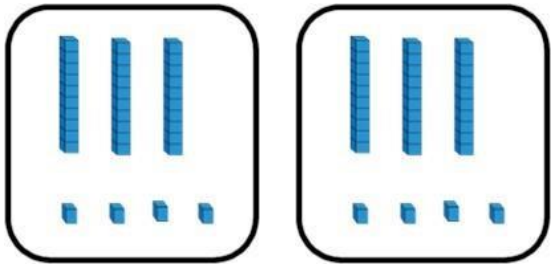
Bead strings to 100 can support children in their understanding of multiplication as repeated addition. Children can build the multiplication using the beads. The colour of beads supports children in seeing how many groups of 10 they have, to calculate the total more efficiently.
Encourage children to count in multiples as they build the number e.g. 4, 8, 12, 16, 20.

Children can also use the bead string to count forwards and backwards in multiples, moving the beads as they count.

When dividing, children build the number they are dividing and then group the beads into the number they are dividing by e.g. 20 divided by 4 – Make 20 and then group the beads into groups of four. Count how many groups you have made to find the answer.

Base 10/Dienes (division)

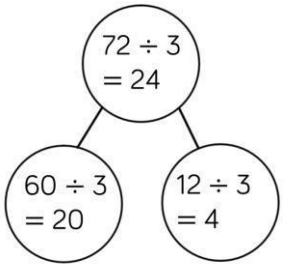
Year 2 (GDS children only)
KS2 (All children)



$68 \div 2 = 34$

Tens	Ones

$72 \div 3 = 24$



Key Facts Corner →

KFC	
1	3
2	6
4	12
8	24
10	30
5	15

Benefits

Using Base 10 or Dienes is an effective way to support children's understanding of division.

When numbers become larger, it can be an effective way to move children from representing numbers as ones towards representing them as tens and ones in order to divide. Children can then share the Base 10/ Dienes between different groups e.g. by drawing circles or by rows on a place value grid.

When they are sharing, children start with the larger place value and work from left to right. If there are any left in a column, they exchange e.g. one ten for ten ones. When recording, encourage children to use the part-whole model so they can consider how the number has been partitioned in order to divide. This will support them with mental methods.

Key Facts Corner (Division)

7335 ÷ 15 = 489

KFC	
1	15
2	30
4	60
8	120
10	150
5	75

3444 ÷ 13 = 264 r1

KFC	
1	13
2	26
4	52
8	104
10	130
5	65

Benefits

When dividing multi-digits by 2-digits, children can use a 'Key Facts Corner' to help divide by grouping.

The Key Facts Corner lists key multiples of the divisor including:

1 x, 2x, 4x, 8x, 10x and 5x.

Once children have completed the Key Facts Corner, they can use the information recorded to work out other multiples of the divisor.

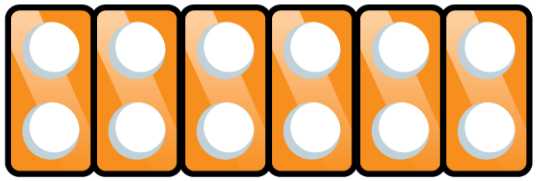
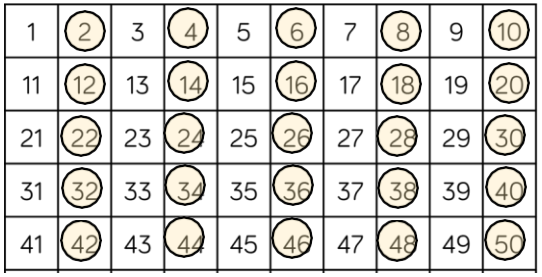
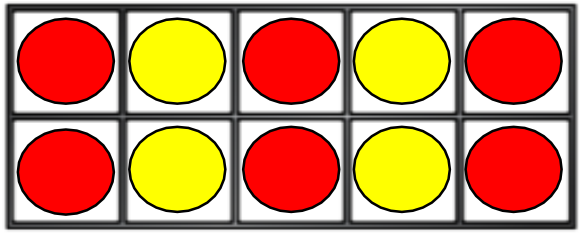
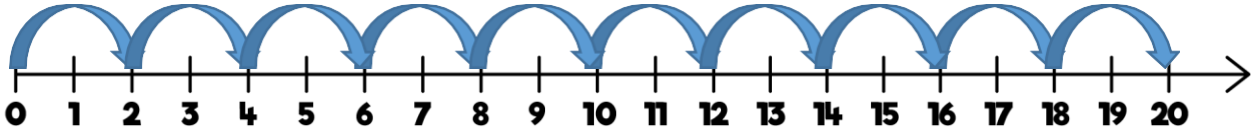
Children use related facts for efficiency with larger numbers.
Such as 10 x 13 = 130
So 100 x 13 = 1,300
So 200 x 13 = 2,600

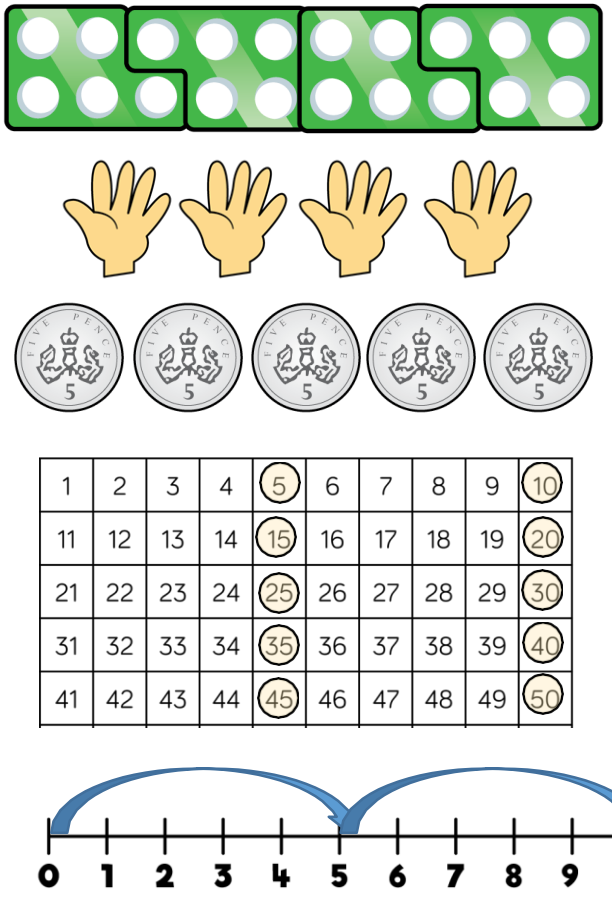
Exploring Multiplication and Times Tables

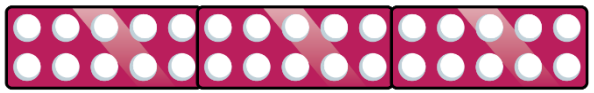
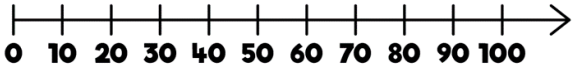
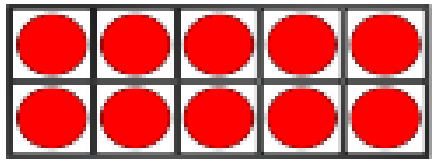
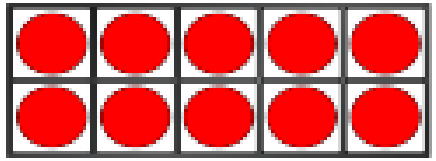
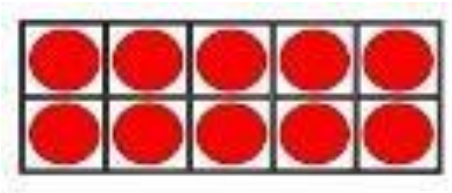
Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 2-times table	2	Bar model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 5-times table	2	Bar model Number shapes 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

Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 3-times table	3	Hundred square Number shapes Counters	Number lines Everyday objects
Recall and use multiplication and division facts for the 4-times table	3	Hundred square Number shapes Counters	Number lines Everyday objects
Recall and use multiplication and division facts for the 8-times table	3	Hundred square Number shapes	Number tracks Everyday objects
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes	Number tracks Everyday objects

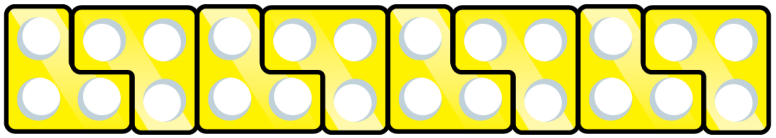
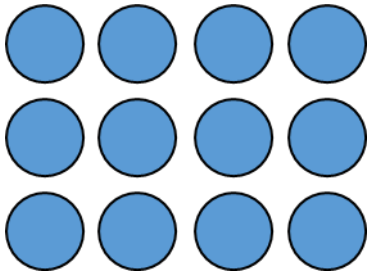
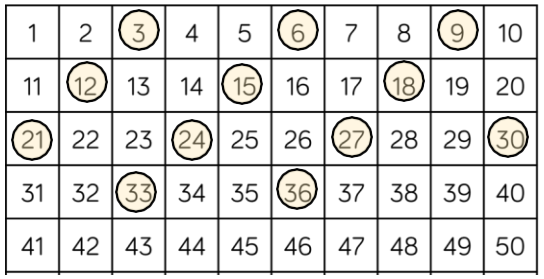
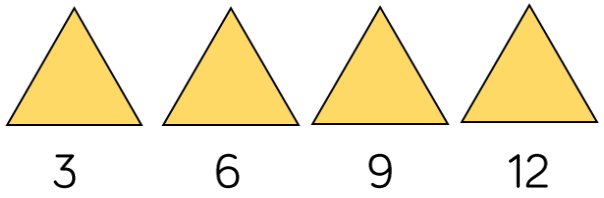
Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes	Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes	Number lines
Recall and use multiplication and 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

Skill: 2 times table	Year: 2
      	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 two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones. Use different models to develop fluency.

Skill: 5 times table	Year: 2
	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 five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

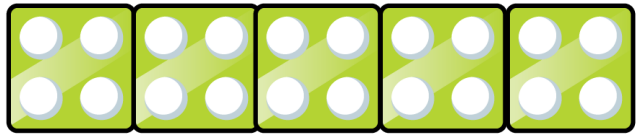
Skill: 10 times table	Year: 2
       	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits- the ones are always 0, and the tens increase by 1 ten each time.

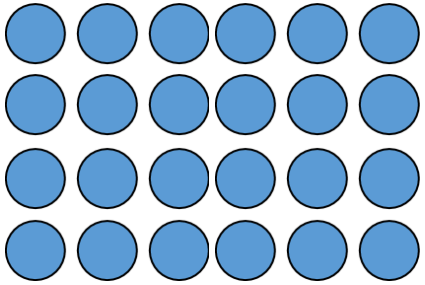
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Skill: 3 times table	Year: 3
    	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 three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

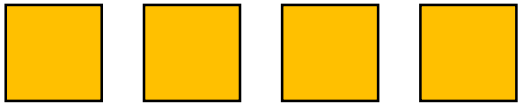
Skill: 4 times table

Year: 3



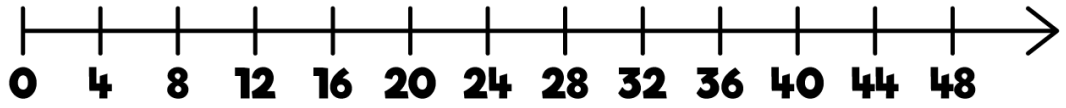


1	2	3	(4)	5	6	7	(8)	9	10
11	(12)	13	14	15	(16)	17	18	19	(20)
21	22	23	(24)	25	26	27	(28)	29	30
31	(32)	33	34	35	(36)	37	38	39	(40)
41	42	43	(44)	45	46	47	(48)	49	50



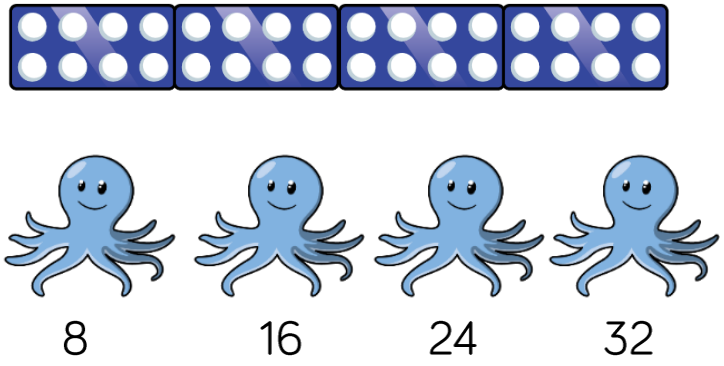
4 8 12 16

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



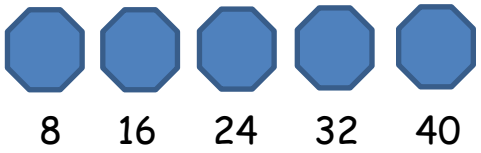
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

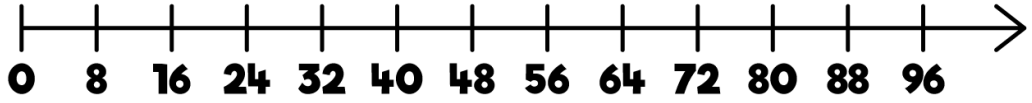
Skill: 8 times table	Year: 3



8	16	24	32	40
48	56	64	72	80

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

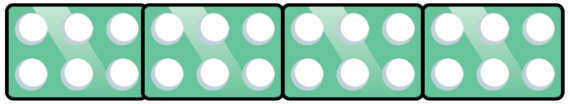


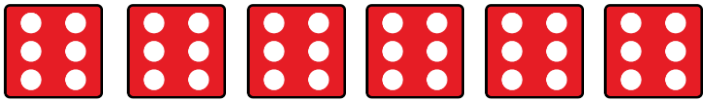


Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

Skill: 6 times table

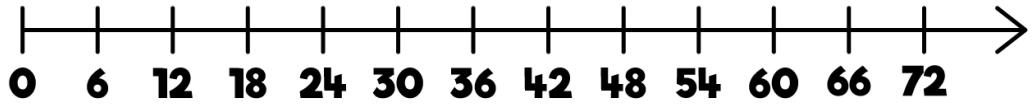
Year: 4





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

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



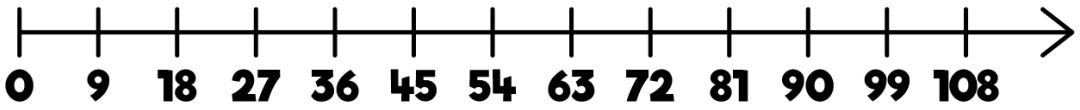
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the six times table, using manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

Skill: 9 times table

Year: 4

9	18	27	36	45
54	63	72	81	90

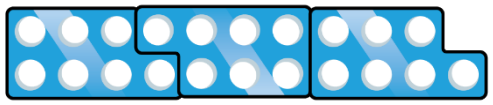
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



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 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.

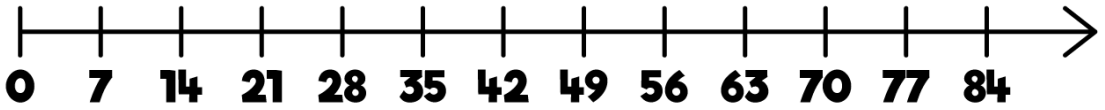
Skill: 7 times table

Year: 4



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	(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

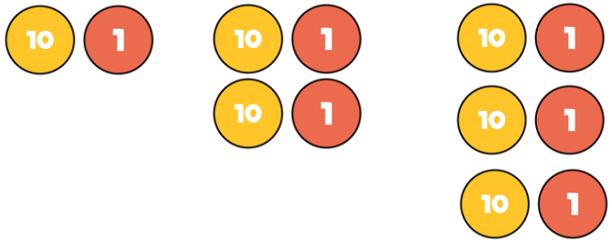


Encourage daily counting in multiples both forwards and backwards, supported by a number line or a hundred square.
The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity.
Children can still see the odd, even pattern in the multiples using number shapes to support.

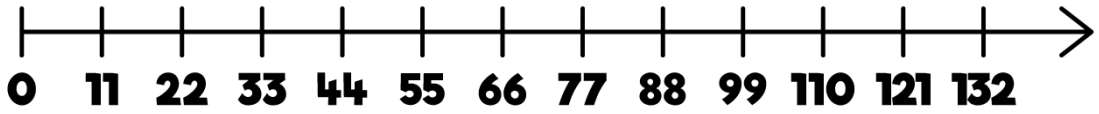
Skill: 11 times table

Year: 4

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	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



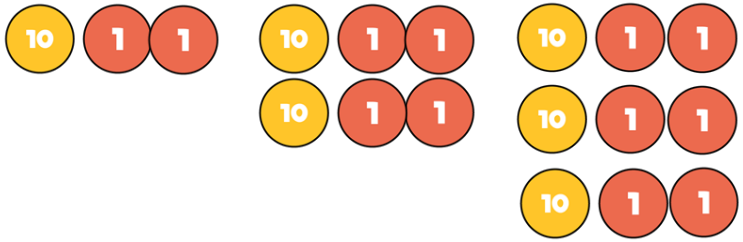
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

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

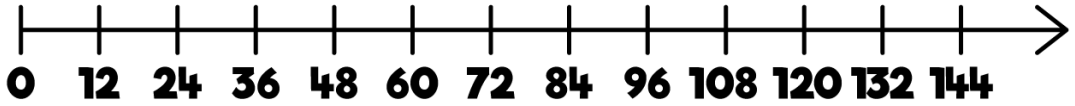
Skill: 12 times table

Year: 4

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	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



Encourage daily counting in multiples, supported by a number line or a hundred square. 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.

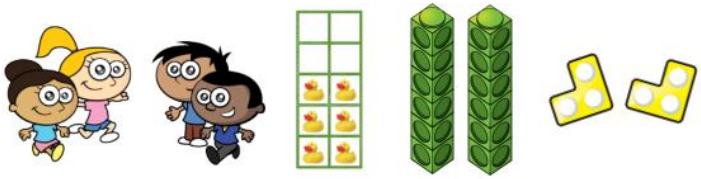
Multiplication

Skill	Year	Representations and models	
Solve one-step problems with multiplication	1/2	Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1-digit numbers	3/4	Awesome arrays	Grid method
Multiply 3-digit by 1-digit numbers	4	Awesome arrays Expanded written	Grid method
Multiply 4-digit by 1-digit numbers	5	Grid method	Expanded written method

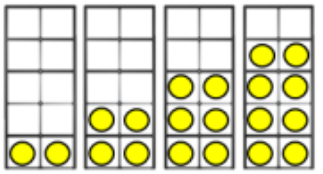
Skill	Year	Representations and models	
Multiply 2-digit by 2-digit numbers	5	Grid method	Expanded written method
Multiply 2-digit by 3-digit numbers	5	Grid method	Expanded written method
Multiply 2-digit by 4-digit numbers	5/6	Grid method	Expanded written method

EYFS Find My Pattern

Explore ways to build doubles



The children will learn that double means 'twice as many'. They should be given opportunities to build doubles using real objects and mathematical equipment. Building numbers using the pairwise patterns on 10 frames helps the children to see the doubles.

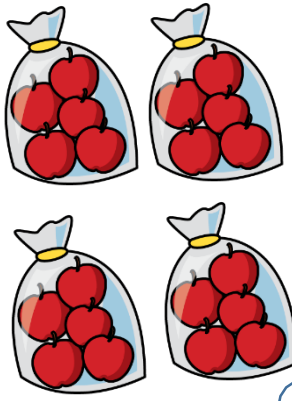


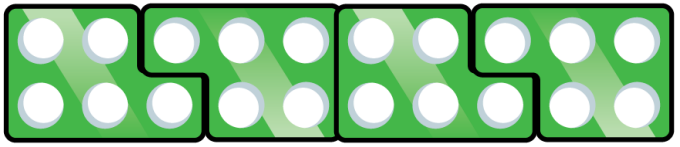
Pair-wise pattern

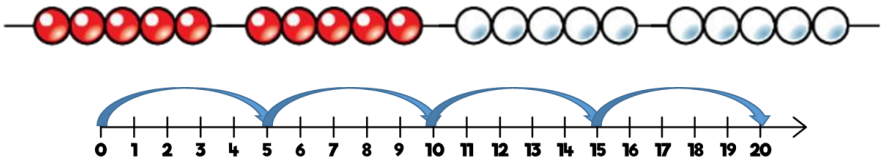
Provide examples of doubles and non-doubles for the children to sort and explain why.

Skill: Solve 1-step problems using multiplication

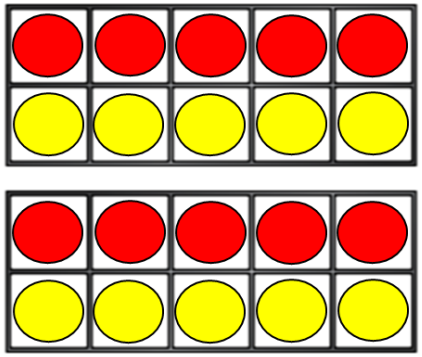
Year: 1/2

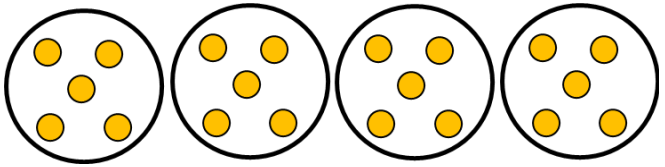


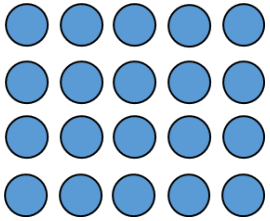




One bag holds 5 apples.
How many apples do 4 bags hold?







$5 + 5 + 5 + 5 = 20$

$4 \times 5 = 20$

4 times 5 = 20
5 multiplied by 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.

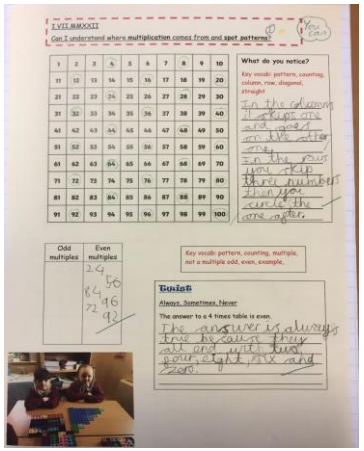
In Year 2, children are introduced to the multiplication symbol.

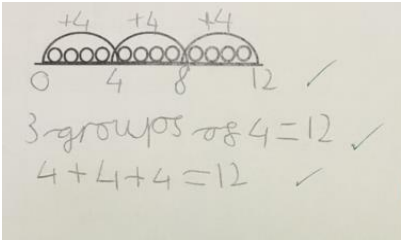
Use vocabulary
Group size multiplied by number of groups
Number of groups times by group size

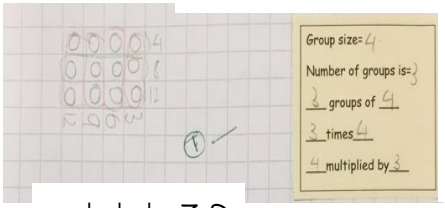
Times Tables

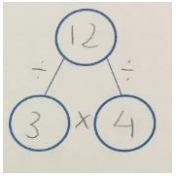
1. Children build a Numicon staircase of the times table. Children look for visual patterns.
2. Children use transparent counters on a 100 number track over the appropriate multiple.
3. Children use transparent counters on a 100 over the appropriate multiple.
4. Record the times table on a 100 square. Practise stable order count. Children look for visual patterns.
5. Record odd and even numbers and other patterns that the children have spotted.

6. On an empty number lines, children build groups of a multiple with counters.
7. Record pictorial versions of this.
8. Children build multiples on empty number line, then move them into an array. Record arrays as groups in blue pencil, completing the sentence frames.
9. Turn the book to see the commutativity of multiplication and group and record again, this time in red. Link to part-part-whole diagram.





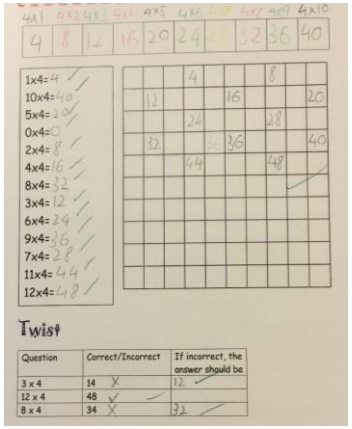




Group size ___
Number of groups ___
___ groups of ___
___ times ___
___ multiplied by ___

Counting stick Year 3 / Year 2 GD

1. Use a counting stick, linking the facts together. Record related facts in the same colour.
   In blue; 4 x 1 = 4. 4 x 10 = 40. Halve to find 4 x 10 = 20.
2. In red; Double 4 x 1 to find 4 x 2 = 8. Double for 4 x 4 = 16. Double for 4 x 8 = 32.
3. In green; Add 4 x 1 and 4 x 2 to find 4 x 3 = 12. Double for 4 x 6 = 24. Add 4 x 3 and 4 x 6 to find 4 x 9 = 36.
4. In yellow; 4 x 7.



KFC Year 3/ Year 2 GD

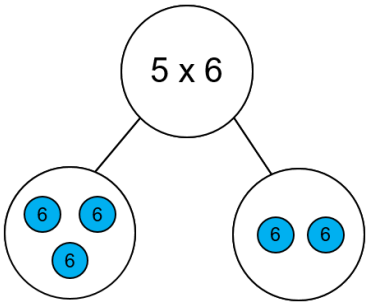
Introduce to the children to KFC (key fact corner) in preparation for future division. Use key facts from counting stick.

Number of groups	Group size
1	4
2	8
4	16
8	32
10	40
5	20

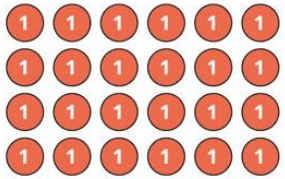
Y4 Distributive law (Ready to Progress 4MD – 3)

Use counters to build arrays and model, for example, that 4 x 5 = 3 x 5 + 1 x 5.

Link to part-part-whole.

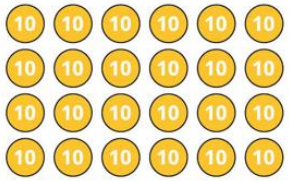


Year 4 - 6 Scaling



4 × 6 ones = ☐ ones

= ☐



4 × 6 tens = ☐ tens

= ☐

4 × 6 hundreds = ☐ hundreds

= ☐

Model using place value counters, within appropriate number range.

Th	H	T	O
		2	4
	2	4	0
2	4	0	0

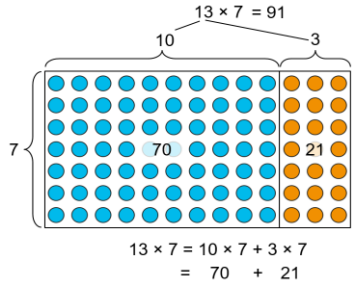
Link to place value charts. What do you notice?

Year 3/4 - Awesome Arrays

Awesome Arrays – introduction to grid method.

1. Using double-sided counters, build a large array using a 2-digit number in the teens x 1-digit.
2. Turn some of the counters round to model partitioning the 2 digit number.
3. Add a post it note to each part showing the total number of counters in the array.
4. Draw around the 2 parts of the array. Take away the counters then replace the post it notes.

Model pictorial representation of this alongside
https://mathsbot.com/activities/multiplicationAreas



Skill: Multiply 2-digit numbers by 1-digit numbers	Year 3/4
Model pictorial representation of this alongside https://mathsbot.com/activities/multiplicationAreas 1) Awesome Arrays (See previous page) 2) Grid method using -teen numbers only (Grid method) 3) Grid method using any 2 digit number	Within appropriate multiplication tables

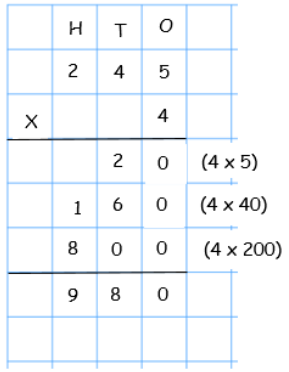
x	30	4
5	150	20

= 170

Skill: Multiply 3-digit numbers by 1-digit numbers	Year 4
245 x 4 = Model pictorial representation of this alongside https://mathsbot.com/activities/multiplicationAreas 1 (Grid method) 2	When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method.

x	200	40	5
4	800	160	20

= 980



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

Year: 5

Model pictorial representation of this alongside
https://mathsbot.com/activities/multiplicationAreas

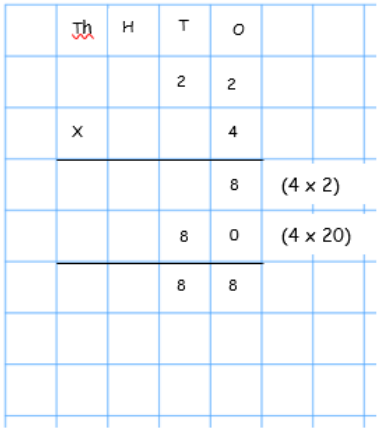
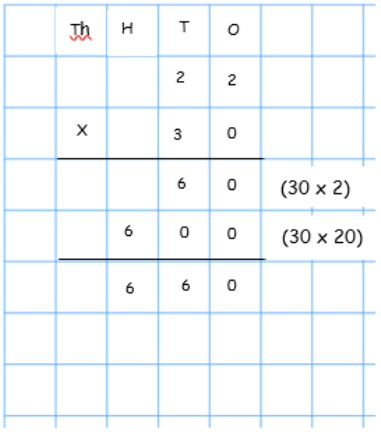
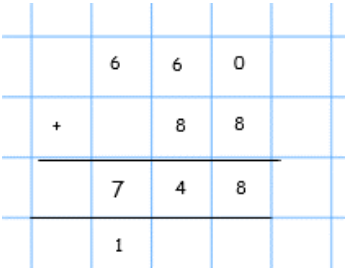
x	1000	800	20	6
3	3000	2400	60	18

= 5478

1,826 × 3 = 5,478

	Th	H	T	O	
	1	8	2	6	
X				3	
			1	8	(3 x 6)
			6	0	(3 x 20)
	2	4	0	0	(3 x 800)
	3	0	0	0	(3 x 1,000)
	5	4	7	8	

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.

Skill: Multiply 2-digit numbers by 2-digit numbers	Year: 5
22 X 34 = 748 Model pictorial representation of this alongside https://mathsbot.com/activities/multiplicationAreas    	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. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.

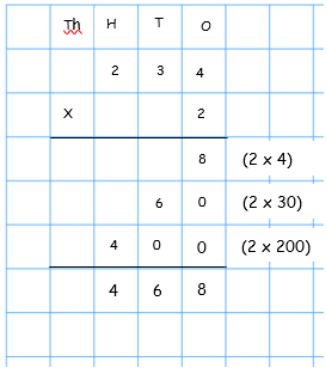
	20	2
30	600	60
4	40	8

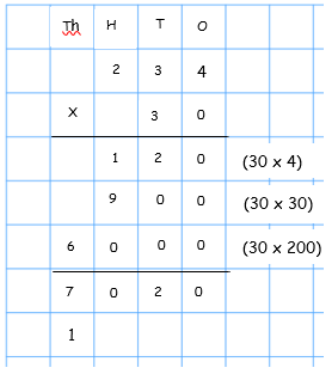
Skill: Multiply 3-digit numbers by 2-digit numbers

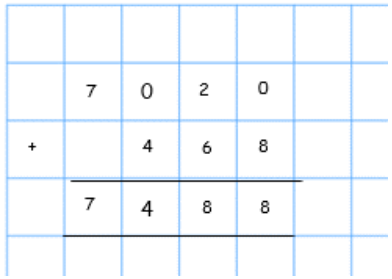
Year: 5

234 x 32 = 7,488

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

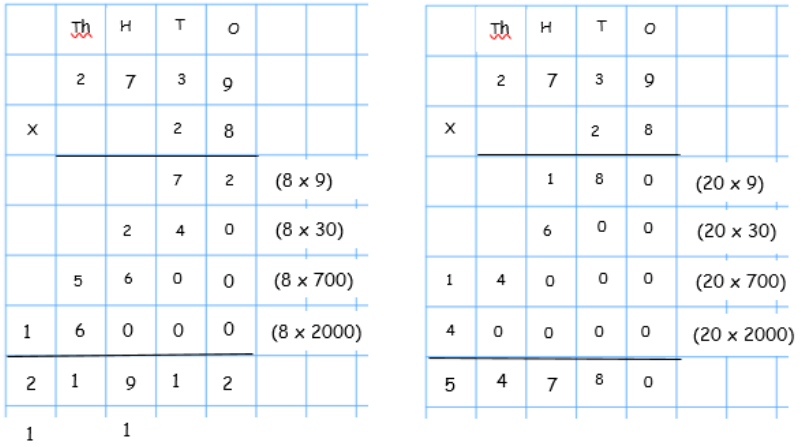






Children can continue to use the area model when multiplying 3-digits by 2-digits.

Encourage children to move towards the formal written method, seeing the links with the grid method.

Skill: Multiply 4-digit numbers by 2-digit numbers	Year: 5/6
	When multiplying 4-digits by 2-digits, children should be confident in the written method.

	Th	H	T	O	
	2	7	3	9	
x			2	8	
			7	2	(8 x 9)
		2	4	0	(8 x 30)
	5	6	0	0	(8 x 700)
1	6	0	0	0	(8 x 2000)
2	1	9	1	2	
1		1			

	Th	H	T	O	
	2	7	3	9	
x			2	8	
		1	8	0	(20 x 9)
		6	0	0	(20 x 30)
1	4	0	0	0	(20 x 700)
4	0	0	0	0	(20 x 2000)
5	4	7	8	0	

	5	4	7	8	0	
+	2	1	9	1	2	
	7	6	6	9	2	
		1				

2,739 × 28 = 76,692

Division

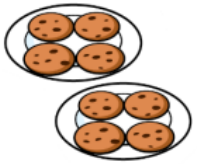
Skill	Year	Representations and models	
Solve one-step problems with division (sharing)	1/2	Bar model Real life objects	Arrays Counters
Solve one-step problems with division (grouping)	1/2	Real life objects Number shapes Bead strings Ten frames	Number lines Arrays Counters
Divide 2-digits by 1-digit (no exchange sharing)	3	Base 10 Bar model	Part-whole model
Divide 2-digits by 1-digit (sharing with exchange)	3	Base 10 Bar model	Part-whole model

Skill	Year	Representations and models	
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Base 10 Bar model	Part-whole model
Divide 2-digits by 1-digit (grouping)	4/5		Place value grid Written short division
Divide 3-digits by 1-digit (sharing with exchange)	4	Base 10 Bar model	Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5		Place value grid Written short division

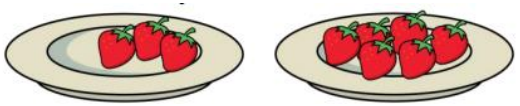
Skill	Year	Representations and models
Divide 4-digits by 1-digit (grouping)	5	Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division List of multiples
Divide multi-digits by 2-digits (long division)	6	Written long division List of multiples

EYFS Find My Pattern

Give the children opportunities to check that items are shared equally and that everyone has the same.

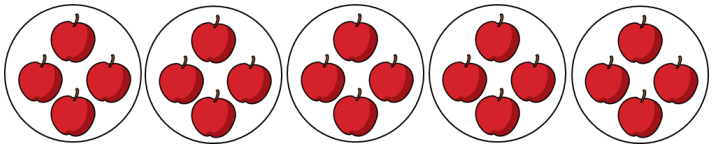
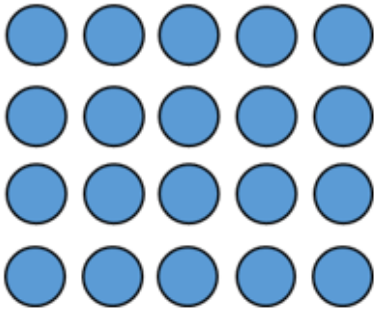
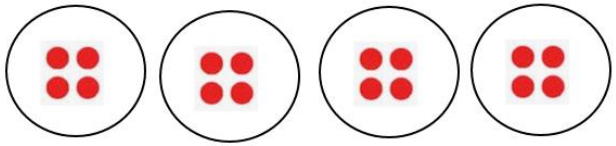


Provide opportunities to recognise and make equal groups. For example can you put 3 crackers on each plate or plant 2 flowers into each pot. What groups do they notice on a bead string? The children will notice that sometimes there are items left over when they share or group. Encourage them to come up with their own suggestions for how to resolve this.



First, then, now

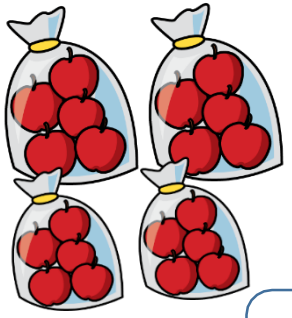
Use first, then and now to tell simple maths stories in real life contexts.

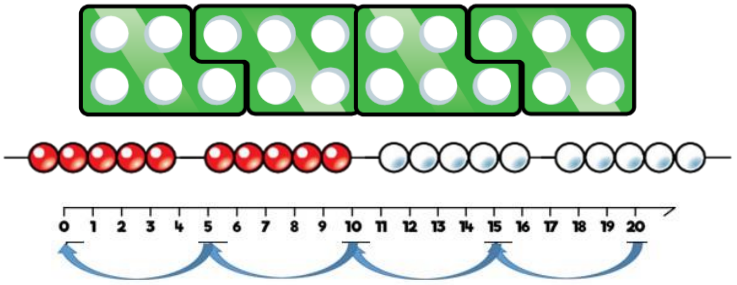
Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
  There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?  **Dividend ÷ divisor = quotient** **For sharing the dividend and quotient are the same units (EG apples in above example)** 20 ÷ 5 = First, then, now Use first, then and now to tell simple maths stories in real life contexts.	Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. Year 1 children are not expected to use the ÷ symbol. In Year 2, children are introduced to the division symbol.

Sharing - 'divided between' **Grouping** - 'divided by groups of' leading to 'divided by'

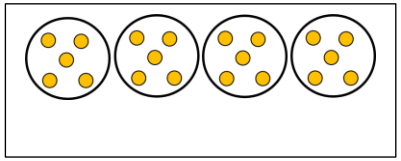
Skill: Solve 1-step problems using division (grouping)

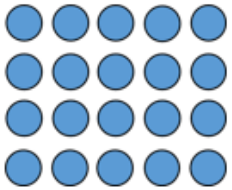
Year: 1/2





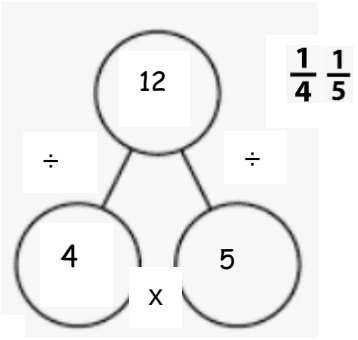
There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?





20 divided by groups of 5 = 4
20 ÷ 5 = 4
20 divided into 5 equal parts = 4
1/3 of 12 = 4

20 divided by groups of 5 = 4
20 ÷ 5 = 4
20 divided into 5 equal parts = 4
1/3 of 12 = 4



$\frac{1}{4}$ $\frac{1}{5}$

First, then, now
Use first, then and now to tell simple maths stories in real life contexts.

$20 \div 5 = 4$

Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

Dividend ÷ divisor = quotient
For grouping the dividend and quotient are different units (EG apples and groups in above example)

Sharing - 'divided between **Grouping** - 'divided by groups of' leading to 'divided

Skill: Divide 2-digits by 1-digit (grouping without remainders)

Year 3/4 within appropriate times table

Practise creating Key Fact Corner (KFC)

Number of groups	X3
1	3
2	6
4	12
8	24
10	30
5	15

Number of groups	X4
1	4
2	8
4	16
8	32
10	40
5	20

Flexible partitioning in a part-whole model supports this method.

Use KFC (key fact corner) to chunk the dividend

Quotient between 10 and 20 before moving to larger numbers

42 ÷ 3 = 14

75 ÷ 3 = 25

30 (10x)
+ 12 (3x)
42

KFC

Number of groups	X3
1	3
2	6
4	12
8	24
10	30
5	15

Use additive chunking to find the number of groups (quotient) in the dividend.

42 ÷ 3 = 14

dividend — divisor — quotient

30 (10x)
+ 30 (10x)
60
+ 15 (5x)
75

KFC

Number of groups	X3
1	3
2	6
4	12
8	24
10	30
5	15

Move to more efficiency using knowledge of scaling

60 (20x)
+ 15 (5x)
75

2 x 3 = 6
So 20 x 3 = 60

Flexible Partitioning - partitioning a number in different ways, not just into units of tens and ones

Skill: Divide 2-digits by 1-digit (Grouping with remainders)

Year: 3/4

Use KFC (key fact corner) to chunk the dividend

Quotient between 10 and 20 before moving to larger numbers

53 ÷ 4 = 13 r 1

40 (10x)
+ 8 (2x)
48
+ 4 (1x)
52 r 1

KFC

Number of groups	X4
1	4
2	8
4	16
8	32
10	40

74 ÷ 3 = 24 r 2

30 (10x)
+ 30 (10x)
60
+ 12 (4x)
72 r 2

KFC

Number of groups	X3
1	3
2	6
4	12
8	24
10	30
5	15

Move to more efficiency using knowledge of related facts

60 (20x)
+ 12 (4x)
72 r 2

Flexible partitioning in a part-whole model supports this method.

Use additive chunking to find the number of groups (quotient) in the dividend.

53 ÷ 4 = 13 r1

dividend
divisor
quotient

Skill: Divide 3-digits by 1-digit (Grouping)

Year 5

$357 \div 3 = 118$ r 3

KFC

Number of groups	X3
1	3
2	6
4	12
8	24
10	30
5	15

Use scaling
10x is 30, so 100x is 300

300 (100x)
+ 30 (10x)
330
+ 24 (8x)
354 r3

Develop efficiency

300 (100x)
+ 54 (18x)
354 r3

Use additive chunking to find the number of groups (quotient) in the dividend.

53 ÷ 4 = 13 r1

dividend, divisor, quotient

Flexible partitioning in a part whole model supports this method.

Flexible Partitioning -partitioning a number in different ways, not just into units of tens and ones

Skill: Divide 4-digits by 1-digit (grouping)

Year: 5

6,115 ÷ 5 = 1223

5000 (1000x)
+ 1000 (200x)
6000
+ 100 (20x)
6100
+ 15 (3x)
6115

KFC and scaling

Number of groups	X5
1	5
2	10
4	20
8	40
10	50
5	25
100	500
1,000	5,000
200	1,000

Use additive chunking to find the number of groups (quotient) in the dividend.

53 ÷ 4 = 13 r1

dividend
divisor
quotient

Skill: Divide multi digits by 2-digits

Year: 6

7,130 ÷ 14 =

5600 (400x)
+ 1400 (100x)
7000
+ 112 (8x)
7112
+ 14 (1x)
7126 r 4

Number of groups	X14
1	14
2	28
4	56
8	112
10	140
5	70
100	1,400
400	5,600

Use additive chunking to find the number of groups (quotient) in the dividend.

53 ÷ 4 = 13 r1

dividend
divisor
quotient

Glossary

Array – An ordered collection of counters, cubes or other item in rows and columns.

Commutative – Numbers can be multiplied in any order.

Dividend – In division, the number that is divided.

Divisor – In division, the number by which another is divided.

Exchange – Change a number or expression for another of an equal value.

Factor – A number that multiplies with another to make a product.

Multiplicand – In multiplication, a number to be multiplied by another.

Partitioning – Splitting a number into its component parts.

Product – The result of multiplying one number by another.

Quotient – The result of a division

Remainder – The amount left over after a division when the divisor is not a factor of the dividend.

Scaling – Enlarging or reducing a number by a given amount, called the scale factor