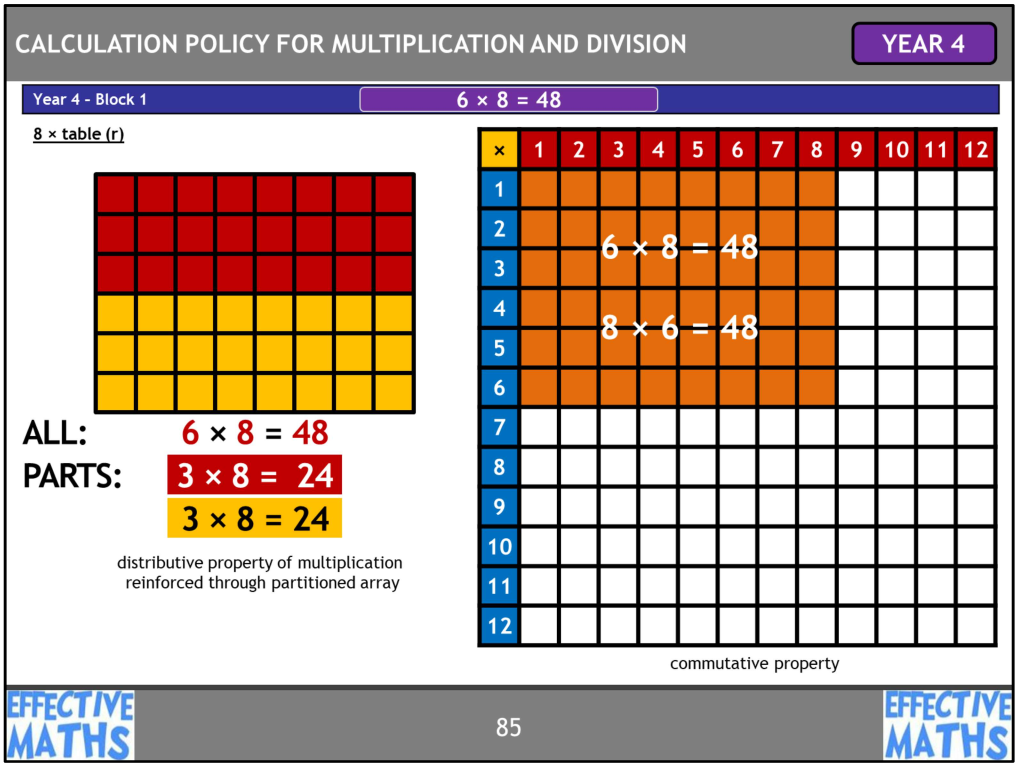
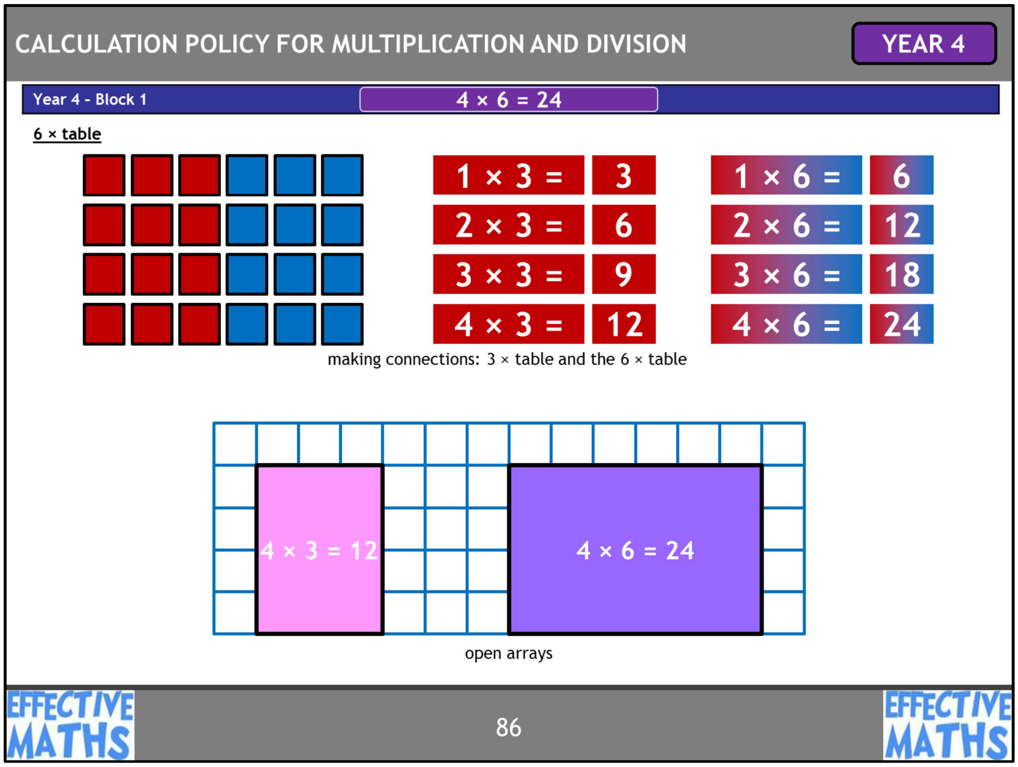


BLOCK 1
× AND ÷ UNIT 1

<u>8 × table (r)</u>
Block 1 begins by revisiting the 8 × table along with consolidating understanding from earlier year groups. This includes understanding of the distributive property of multiplication, through partitioning arrays:
6 × 8 = **3** × 8 + **3** × 8.
The distributive property allows a factor in a multiplication expression to be decomposed into two or more numbers, and those numbers can be multiplied by the other factor in the multiplication expression.

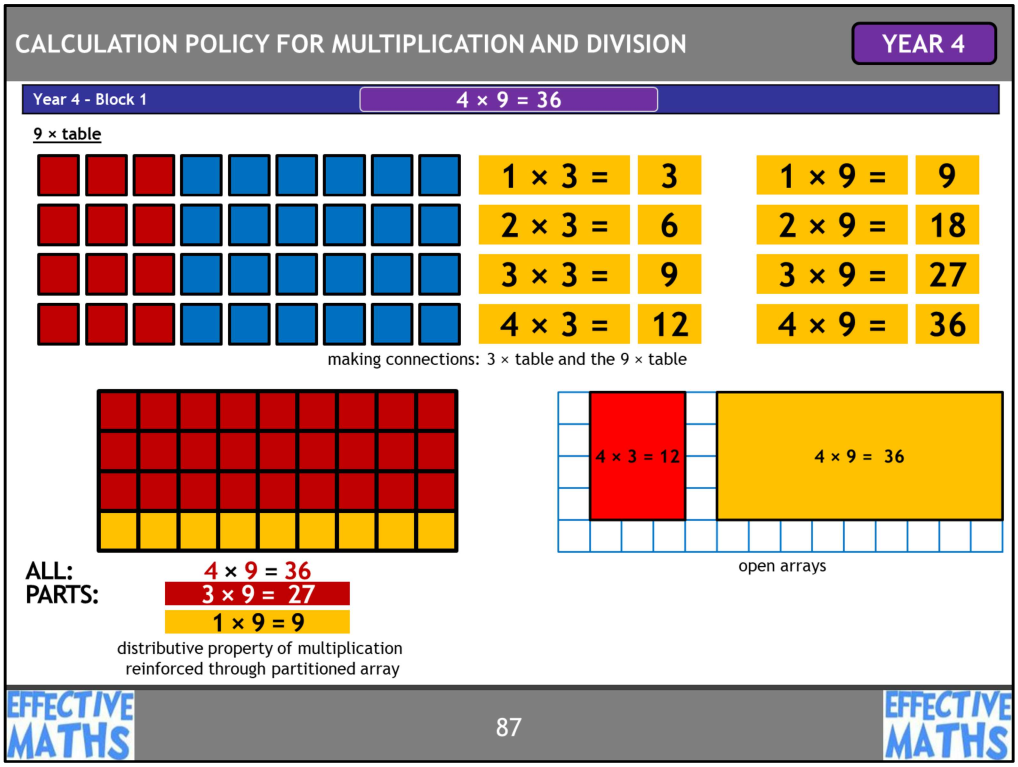
Children’s understanding of the commutative property is developed through interpreting representations on multiplication grids in two ways, eg:
6 × 8 = 48
8 × 6 = 48



<u>6 × table</u>

Learning about the 6 × table makes links to the 3 × table which children learnt in Year 3. Children encountered open arrays in Year 3 and are re-familiarised with the concept again. (In an open array, the squares or individual objects are not indicated within the interior of the array rectangle. An open array does not have to be drawn to scale.)

They explore the pattern formed in the products of the 6 × table.

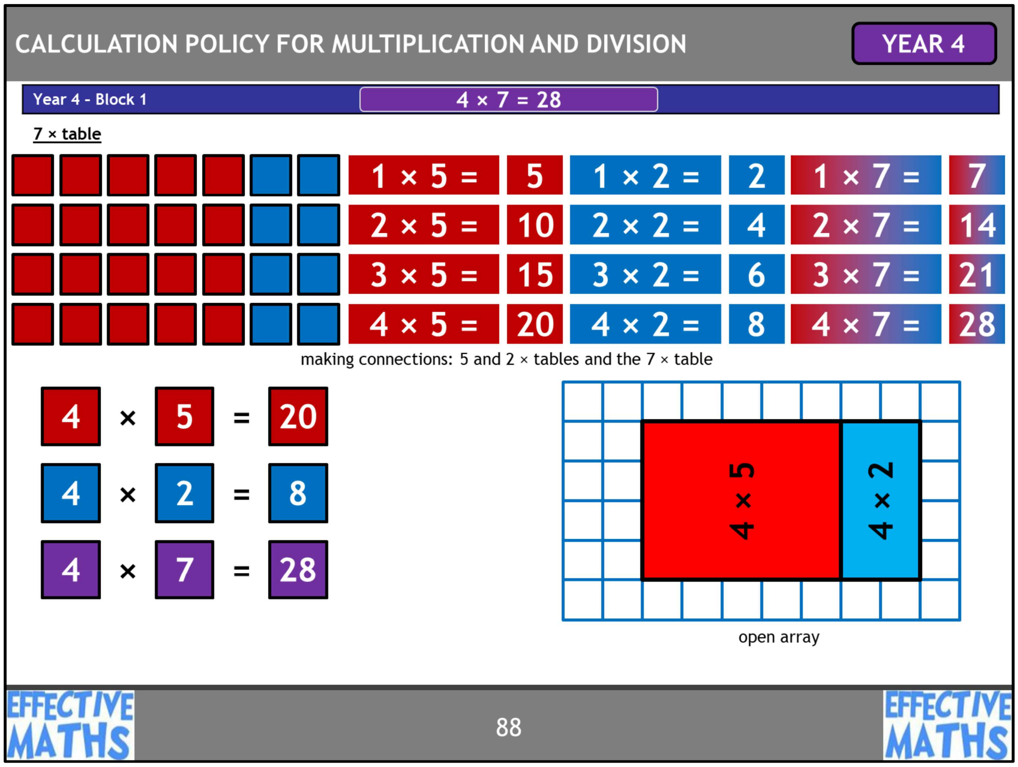


<u>9 × table</u>

Learning about the 9 × table makes links to the 3 × table which children learnt in Year 3 and revisited when they began to learn the 6 × table. Understanding of the distributive property of multiplication is reinforced through partitioned arrays, eg:

4 × 9 = 36
3 × 9 = 27
1 × 9 = 9

Children find multiplication statements to interpret open arrays. They also explore the pattern formed in the products of the 9 × table.

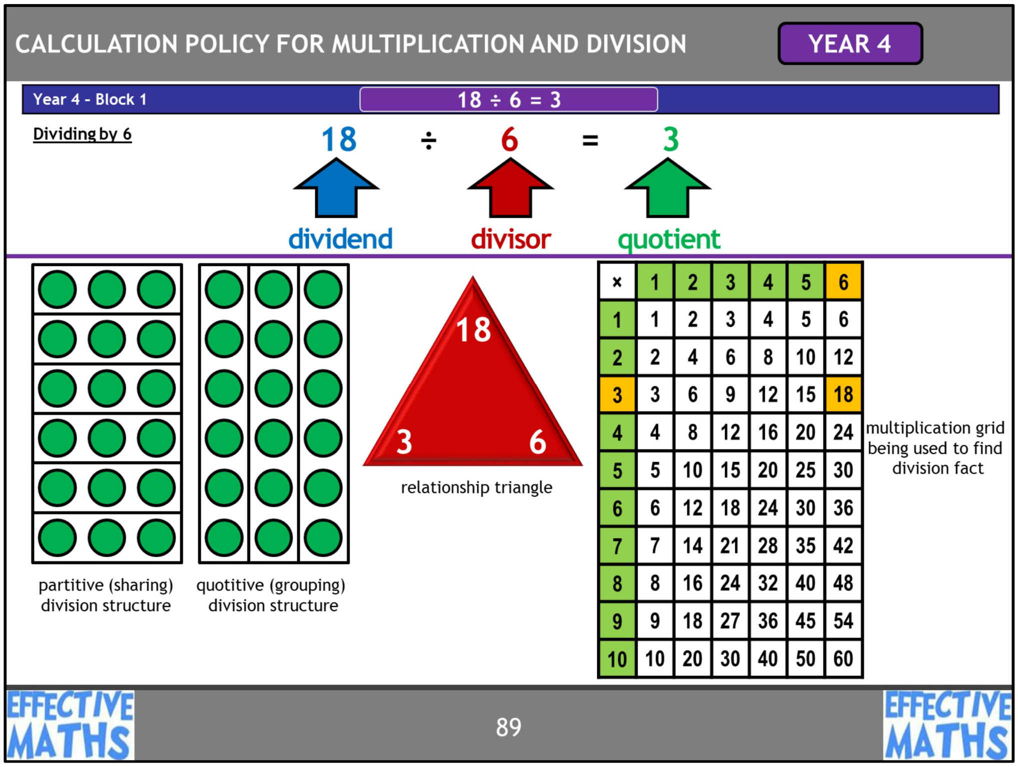


7 × table

Learning about the 7 × table makes links to the 5 and 2 × tables which children learnt in Year 2. Understanding is reinforced through partitioned arrays, eg:
4 × 5 = 20
4 × 2 = 8
4 × 7 = 28

Children find multiplication statements to interpret open arrays.

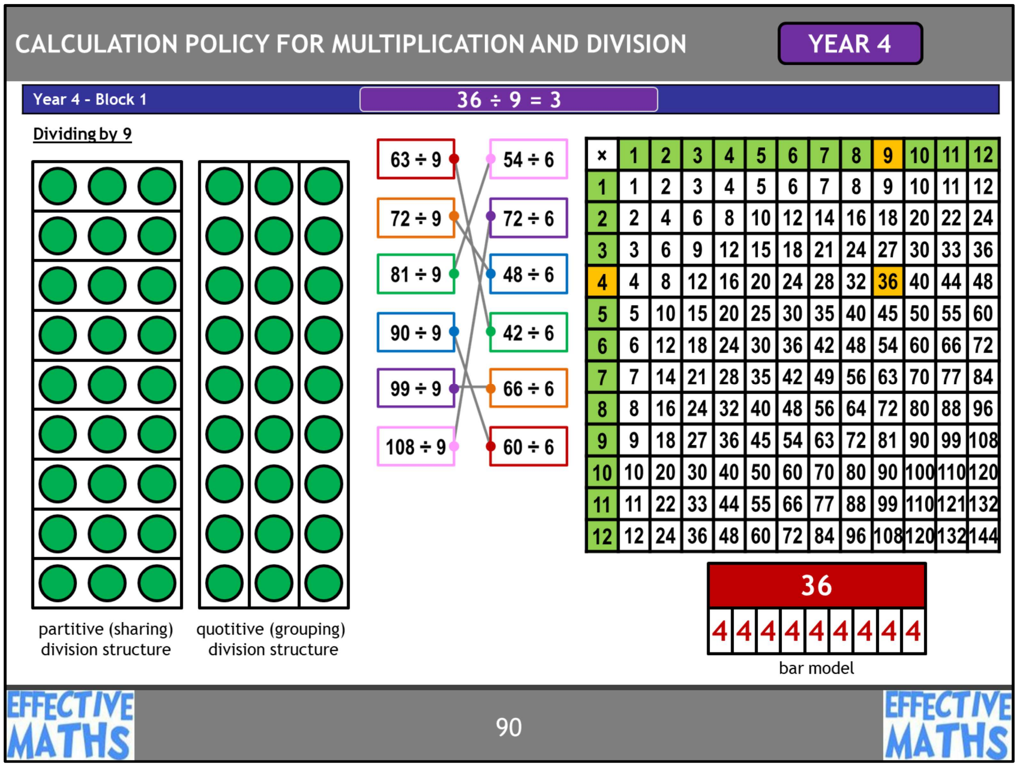
After children have been introduced to the 6, 9 and 7 multiplication tables teachers need to provide plenty of opportunities for these – and all the others - to be practised.
When children commit multiplication table facts to memory, they do so using a verbal sound pattern to associate the 3 relevant numbers, for example, “seven threes make twenty-one”. It is important to provide opportunities for pupils to verbalise each multiplication fact as part of the process of developing fluency. (DfE Ready to Progress guidance.) Read them as ‘One three is three; two threes make six; three threes make nine’ etc.



×	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	12
3	3	6	9	12	15	18
4	4	8	12	16	20	24
5	5	10	15	20	25	30
6	6	12	18	24	30	36
7	7	14	21	28	35	42
8	8	16	24	32	40	48
9	9	18	27	36	45	54
10	10	20	30	40	50	60

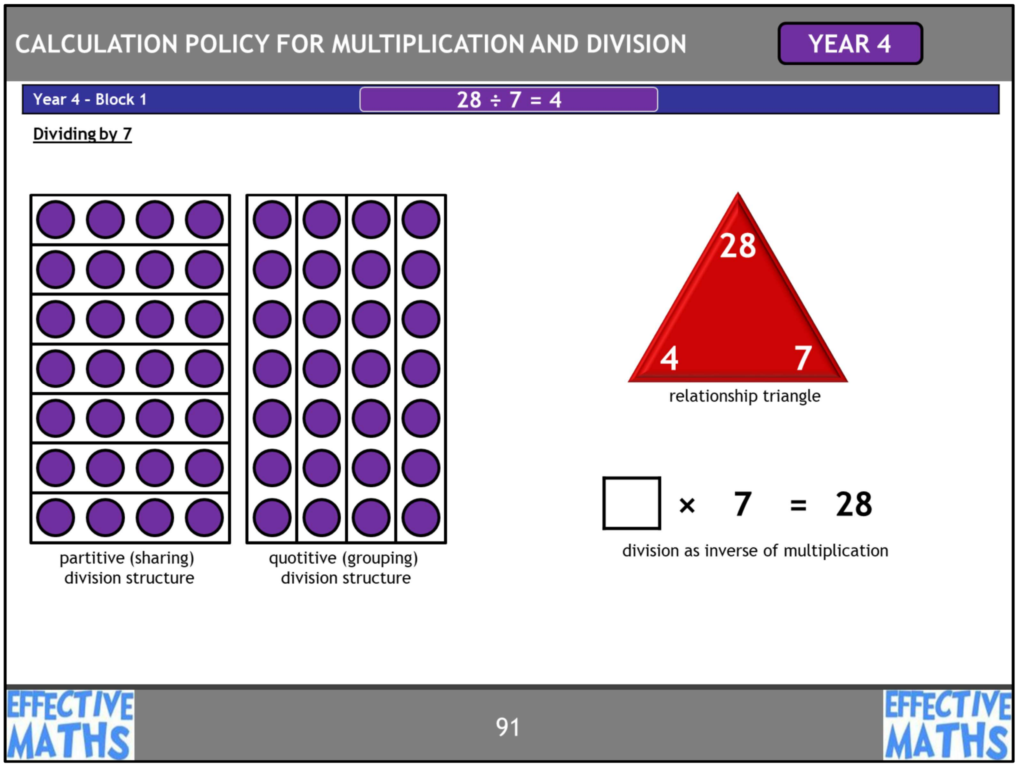
Dividing by 6

Children continue to use language about division that was introduced in Year 3, (dividend, divisor and quotient). In Year 2 and Year 3 children encountered two division structures, sharing and grouping. This continues in Year 4 and they interpret diagrams using both structures. Children should be very familiar with the relationship triangle and these are used to promote links between multiplication facts and division facts. Teaching builds on work from Year 3 using the multiplication grid to find division facts.



Dividing by 9

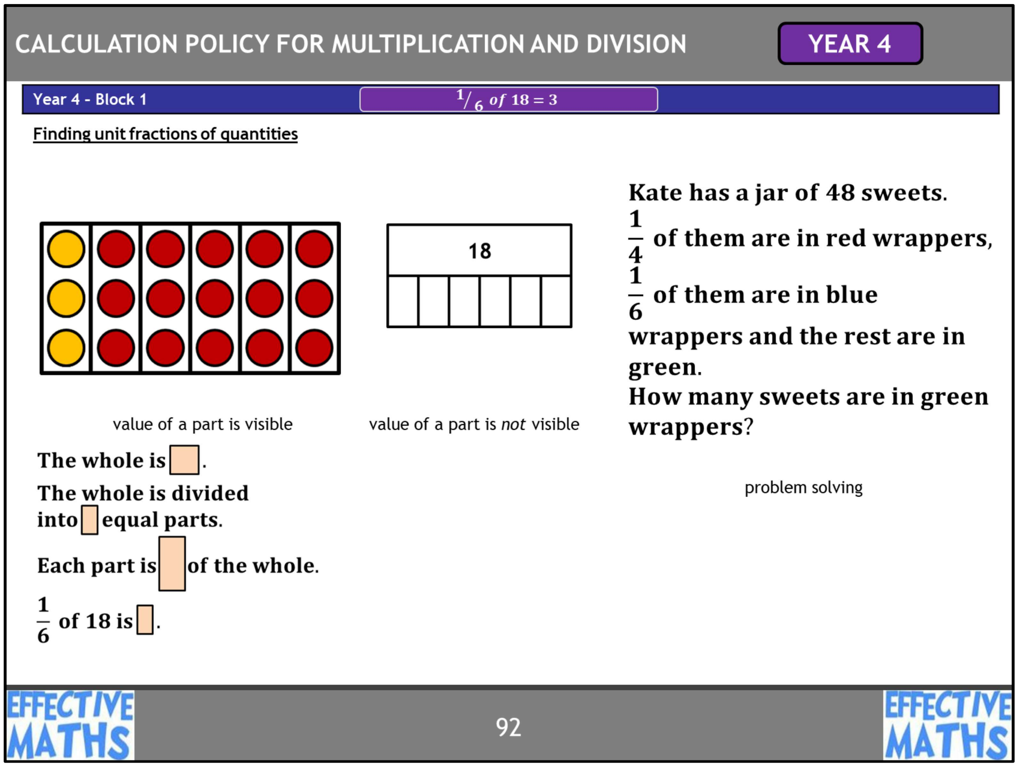
Learning to divide by 9 continues to develop understanding of the sharing and grouping structures. Children use the multiplication grid to derive division facts and interpret bar models.



<u>Dividing by 7</u>

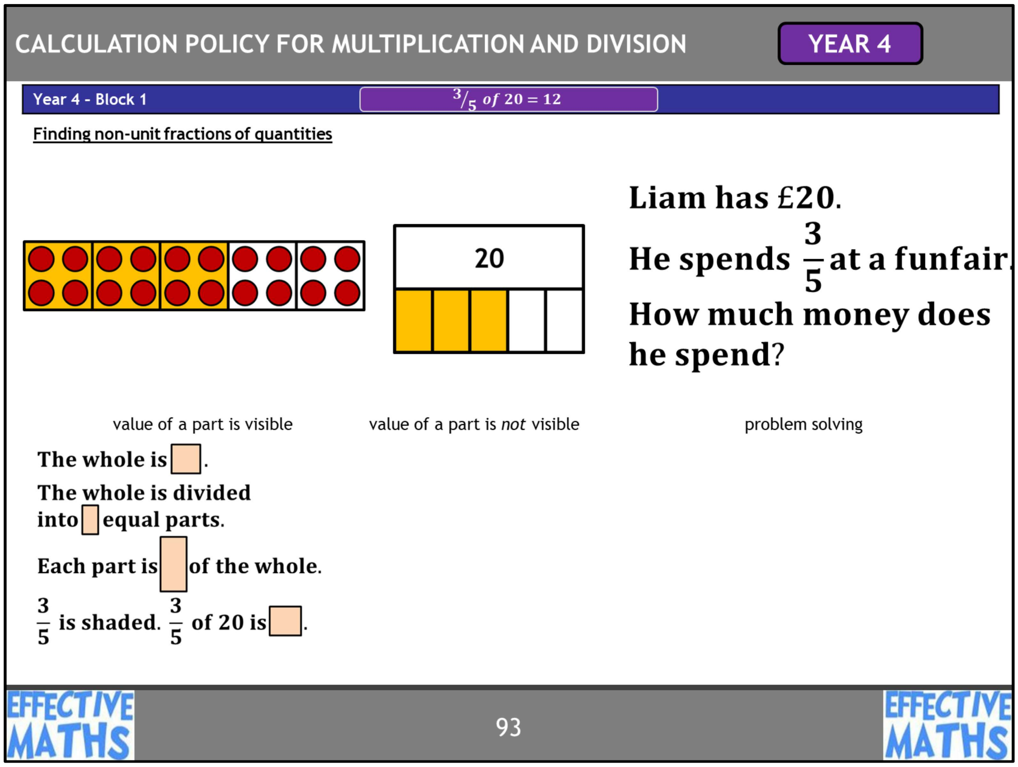
The final lesson of the unit focuses on dividing by 7. The concepts (sharing and grouping) and representations (arrays, relationship triangles and multiplication grids) should be familiar to the children.

They solve problems involving the inverse.



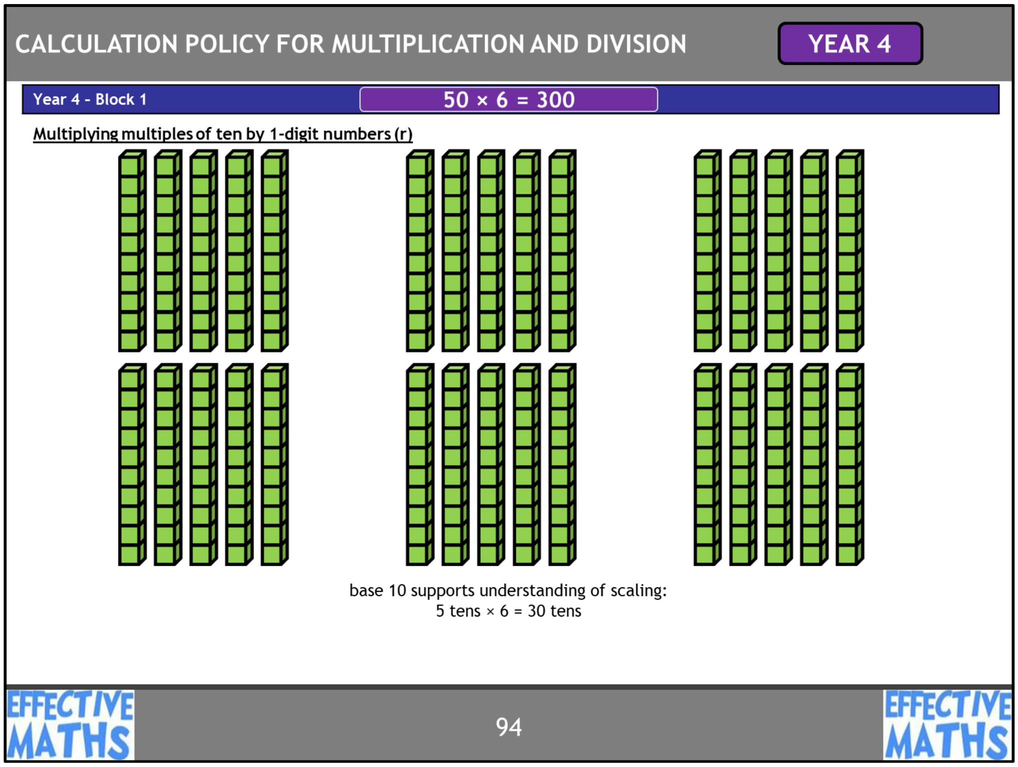
BLOCK 1
FRACTIONS UNIT 1

Finding unit fractions of quantities
Children have experience of finding halves, thirds, quarters, fifths, eighths and tenths linked to multiplication tables encountered in Year 2 and Year 3. That experience is now extended to finding sixths, sevenths and ninths (linked to multiplication tables they should know/be learning). Teaching stresses the connection between a unit fraction of a quantity and dividing that quantity by the denominator.
Visual representations and careful use of language support understanding.
Learning progresses from describing situations where the value of a part is visible to situations the value of a part cannot be seen.



Finding non-unit fractions of quantities

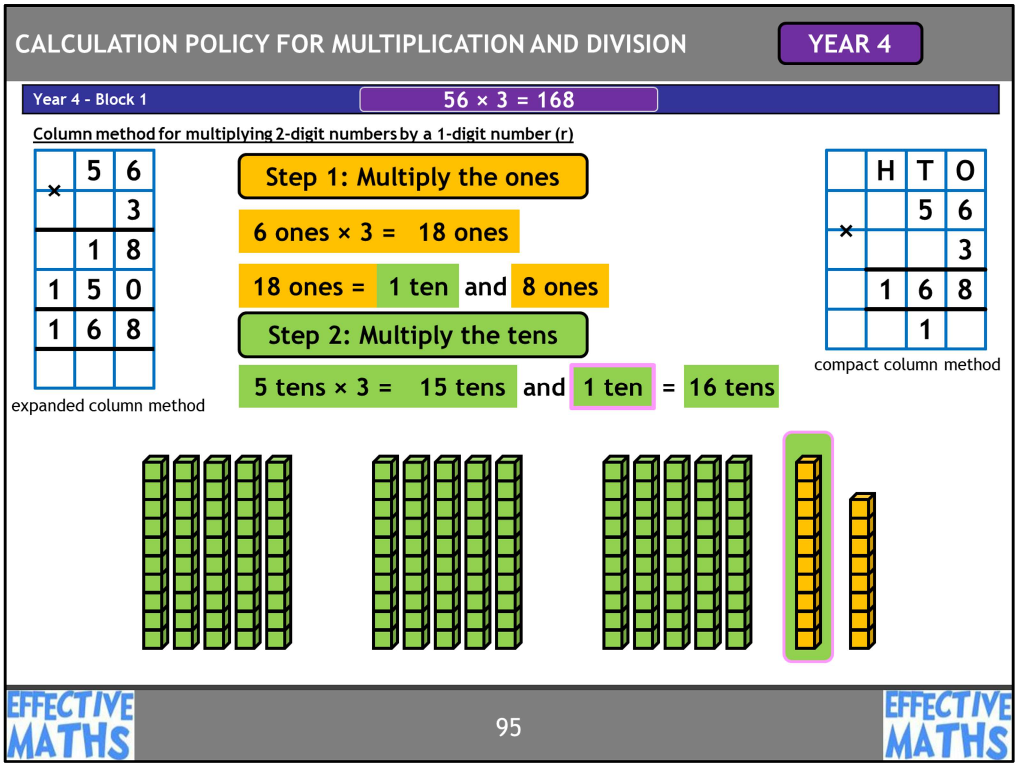
Learning now moves on to finding non-unit fractions of quantities. Teaching models using division to find the unit fraction and then multiplication to find multiples of the unit fraction.
The non-unit fractions used have denominators linked to multiplication tables that children should be very familiar with (halves, thirds, quarters, fifths, eighths and tenths).



BLOCK 1
× AND ÷ UNIT 2

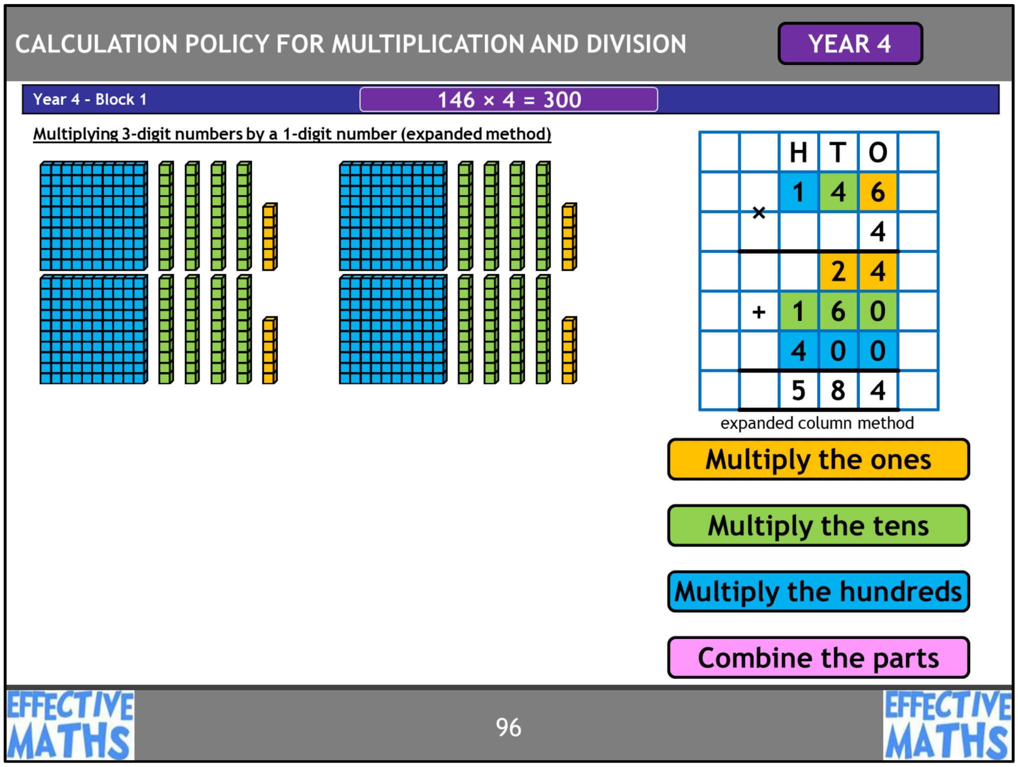
Unit 2 begins by revising the 6 × table through the context of partitioned arrays and

<u>Multiplying multiples of ten by 1-digit numbers (r)</u>
Understanding about using scaling to derive new multiplication facts from known facts is consolidated. For example:
5 × 6 = 30
50 × 6 = 5 tens × 6 = 30 tens = 300
Base ten is used to support conceptual understanding.
As you say ‘30 tens’ it is useful to write 300 (underlining the zero as you say ‘tens’). Then read 30 tens/300 as three hundred/300.



Column method for multiplying 2-digit numbers by a 1-digit number (r)

Multiplying a 2-digit number is revised (from Year 3) prior to moving on to using the expanded method to multiply a 3-digit number.
Accurate use of language is key to ensuring conceptual understanding. For example:
6 ones × 3 = 18 ones
18 ones = 1 ten and 8 ones
Connections are made between the expanded column method and the compact column method.



Multiplying 3-digit numbers (expanded method)

Multiplying a 3-digit number by a 1-digit number is learnt using a method children already know – the expanded column method. The only thing different is there are now three digits.
Accurate use of language remains key. For example:
6 ones × 4 = 24 ones. 24 ones = 2 tens and 4 ones.
4 tens × 4 = 16 tens. 16 tens = 1 hundred and 6 tens.

Year 4 - Block 1 146 × 4 = 300

Division with remainders

Total number of eggs (dividend)	Number of eggs in each carton (divisor)	Number of cartons (quotient)	Number of eggs left over (remainder)	Division sentence
12	6	2	0	12 ÷ 6 = 2
13	6	2	1	13 ÷ 6 = 2 r 1
14	6	2	2	14 ÷ 6 = 2 r 2
15	6	2	3	15 ÷ 6 = 2 r 3
16	6	2	4	16 ÷ 6 = 2 r 4
17	6	2	5	17 ÷ 6 = 2 r 5
18	6	3	0	18 ÷ 6 = 3 r 0
19	6	3	1	19 ÷ 6 = 3 r 1

dividend (12) is a multiple of the divisor (6) - there is no remainder

dividends (13-17) are not multiples of the divisor (6) - there are remainders

dividend (18) is a multiple of the divisor (6) - there is no remainder

Division with remainders

Until this point, all work on division has resulted in quotients that are whole numbers, i.e. there have been no remainders.

Teaching now helps children recognise that a remainder arises when there is something ‘left over’ in a division calculation. Children need to recognise and understand why remainders only occur when the dividend is not a multiple of the divisor. This can be achieved by discussing the patterns seen when the dividend is incrementally increased by 1 while the divisor is kept the same.

Teaching stresses the following points.

- If the dividend is a multiple of the divisor there is no remainder.
- If the dividend is not a multiple of the divisor, there is a remainder.
- The remainder is always less than the divisor.

CALCULATION POLICY FOR MULTIPLICATION AND DIVISION YEAR 4

Year 4 - Block 2

Multiplying and dividing by ten

Th	H	T	O	t	h
			0 ·	1	
			1		
		1	0		
	1	0	0		

thousands	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
hundreds	100	200	300	400	500	600	700	800	900
tens	10	20	30	40	50	60	70	80	90
ones	1	2	3	4	5	6	7	8	9
tenths	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
hundredths	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

EFFECTIVE MATHS 98 EFFECTIVE MATHS

BLOCK 2
MONEY AND DECIMALS UNIT 1

Multiplying and dividing by ten
Two representations support understanding of what happens to the digits when we multiply or divide by ten:

- the place value chart;
- the Gattegno chart.

Children learn that when we multiply by ten each digit moves one pace to the left on the place value chart and one row up on the Gattegno chart. They learn about the respective movements for dividing by ten.

CALCULATION POLICY FOR MULTIPLICATION AND DIVISION

YEAR 4

Year 4 - Block 2

<u>Multiplying and dividing 1- and 2- digit numbers by 100</u>

÷ 100

Th	H	T	O	t	h
		1	0		
			0.	1	

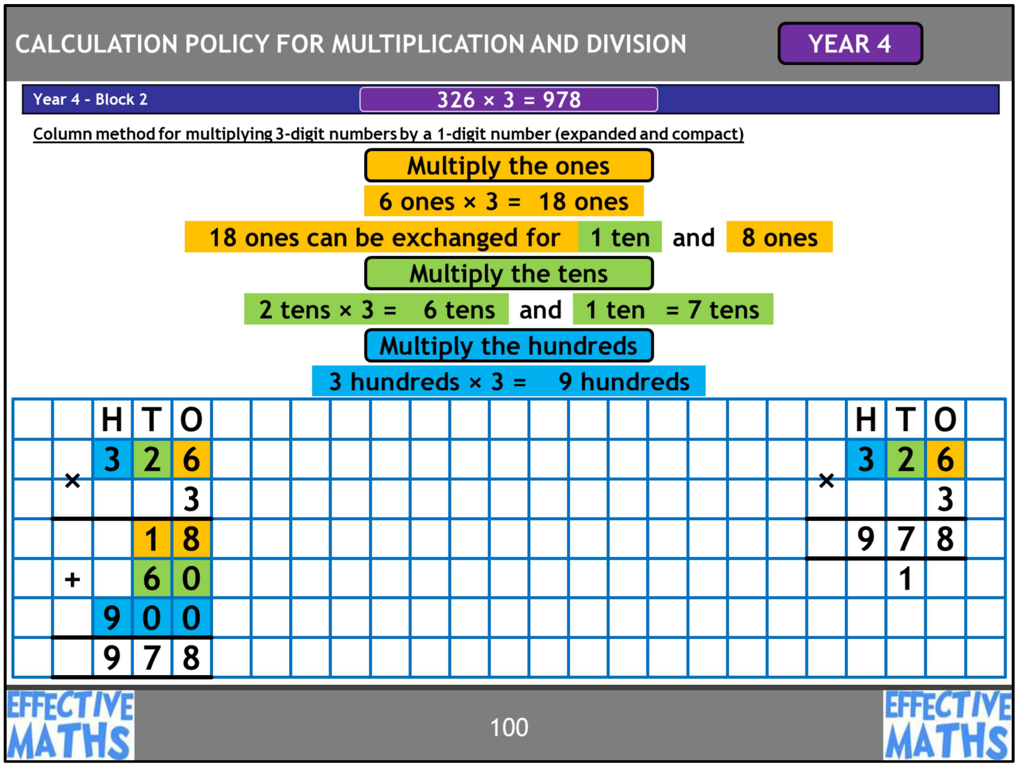
thousands	1,000	2,000	3,000	4,000	5,000	6,000	7,000	8,000	9,000
hundreds	100	200	300	400	500	600	700	800	900
tens	10	20	30	40	50	60	70	80	90
ones	1	2	3	4	5	6	7	8	9
tenths	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
hundredths	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09

99

<u>Multiplying and dividing 1- and 2- digit numbers by 100</u>

The same representations (i.e. the place value chart and the Gattegno chart) support understanding of what happens to the digits when we multiply or divide by one hundred.

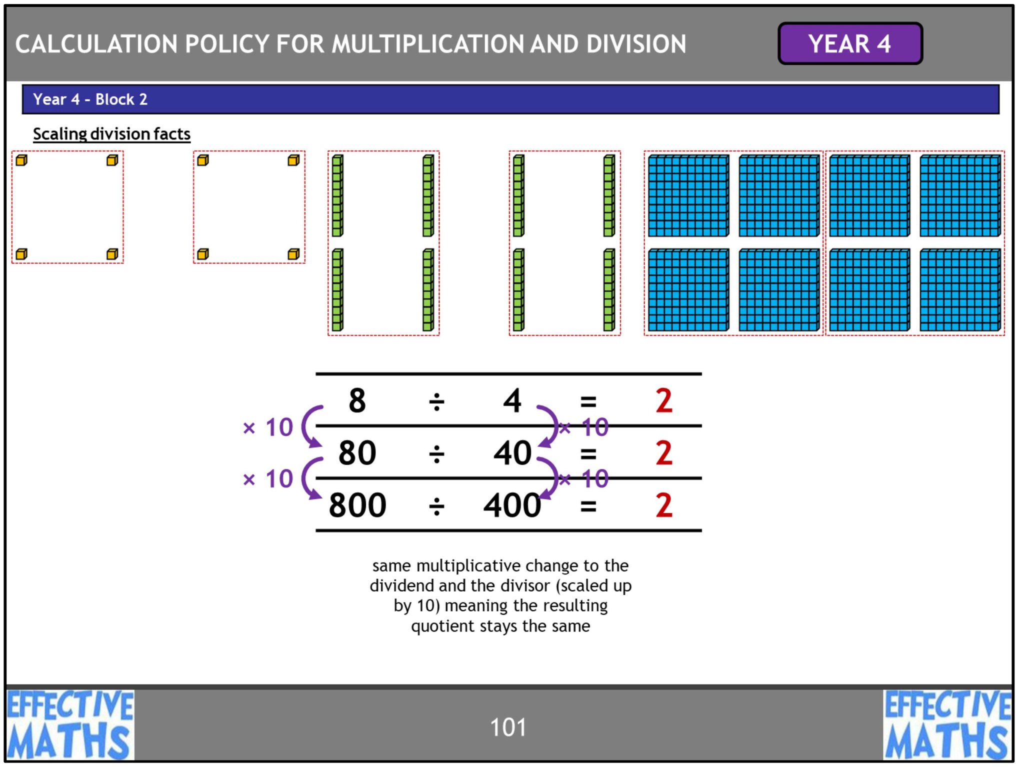
Children learn that when we multiply by one hundred each digit moves two places to the left on the place value chart and two rows up on the Gattegno chart. They learn about the respective movements for dividing by one hundred.



BLOCK 2
× and ÷ UNIT 3

<u>Column method for multiplying 3-digit numbers by a 1-digit number (expanded and compact)</u>

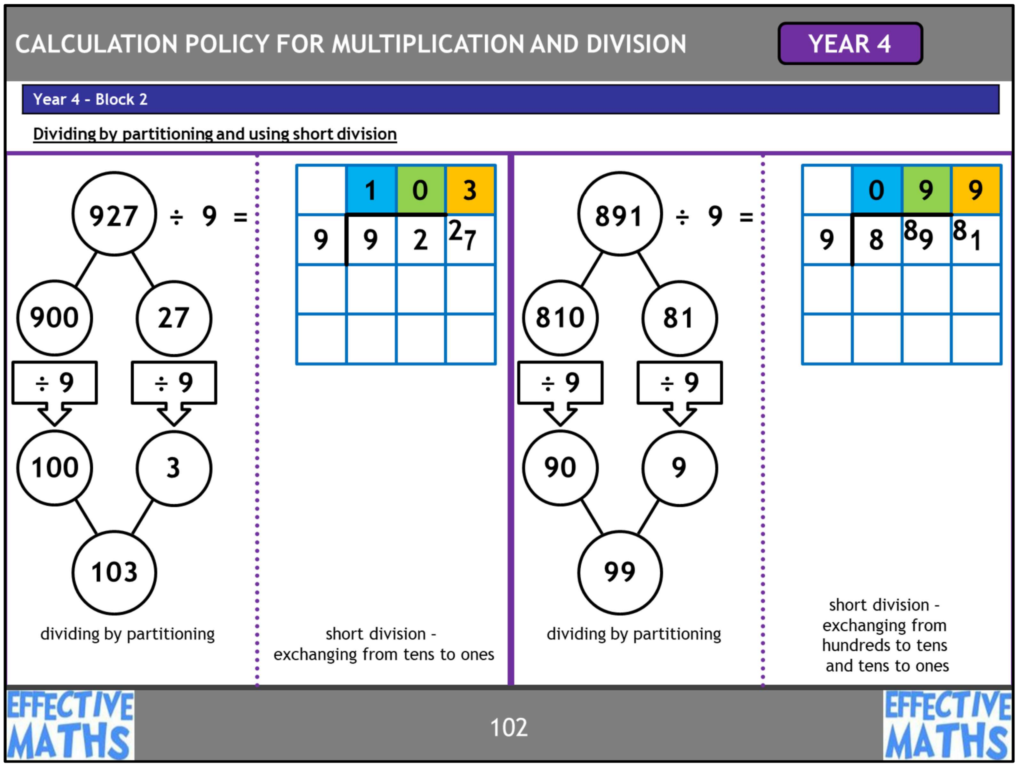
In Unit 2 children used the compact column method to multiply 2-digit numbers and the expanded method to multiply 3-digit numbers. Now they learn to apply the compact method to the multiplication of 3-digit numbers.
Accurate use of language is key to ensuring conceptual understanding. For example:
6 ones × 3 = 18 ones. 18 ones = 1 ten and 8 ones.
2 tens × 3 = 6 tens plus 1 ten = 7 tens.
3 hundreds × 3 = 9 hundreds.



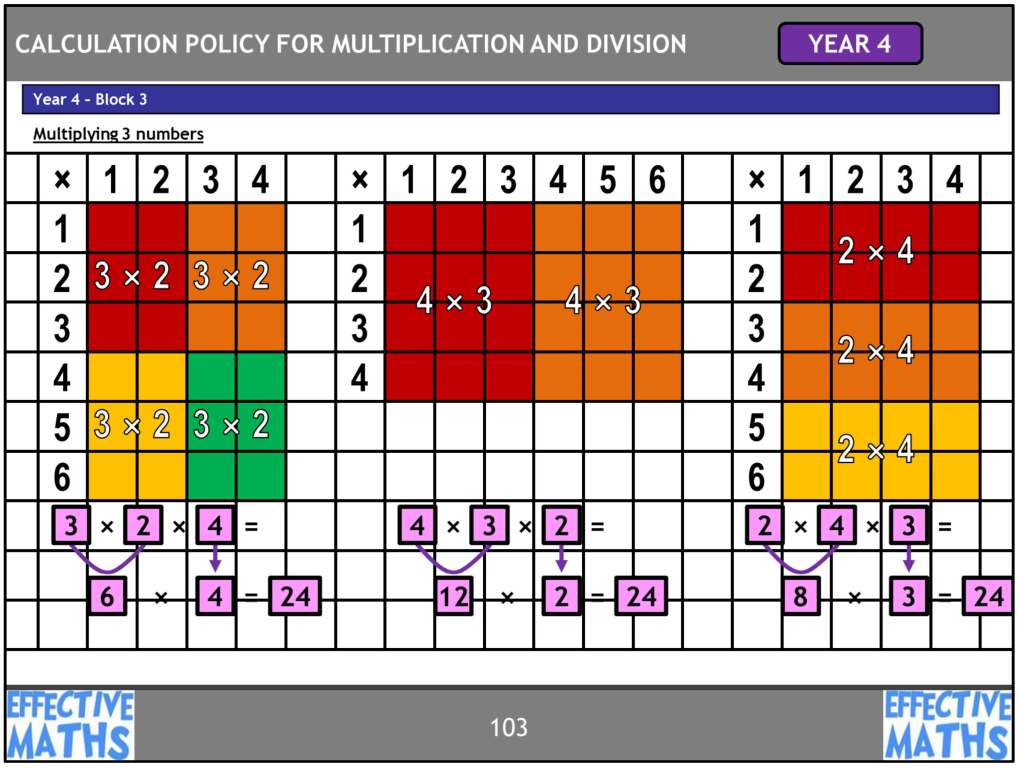
Scaling division facts

Base ten representations support understanding that when there is the same multiplicative change to the dividend and the divisor the resulting quotient stays the same. Scaling can help us to arrive at a simpler calculation to support answering a more complex calculation. For example:

42 ÷ 7 is easier than
84 ÷ 14 which is easier than
168 ÷ 28.

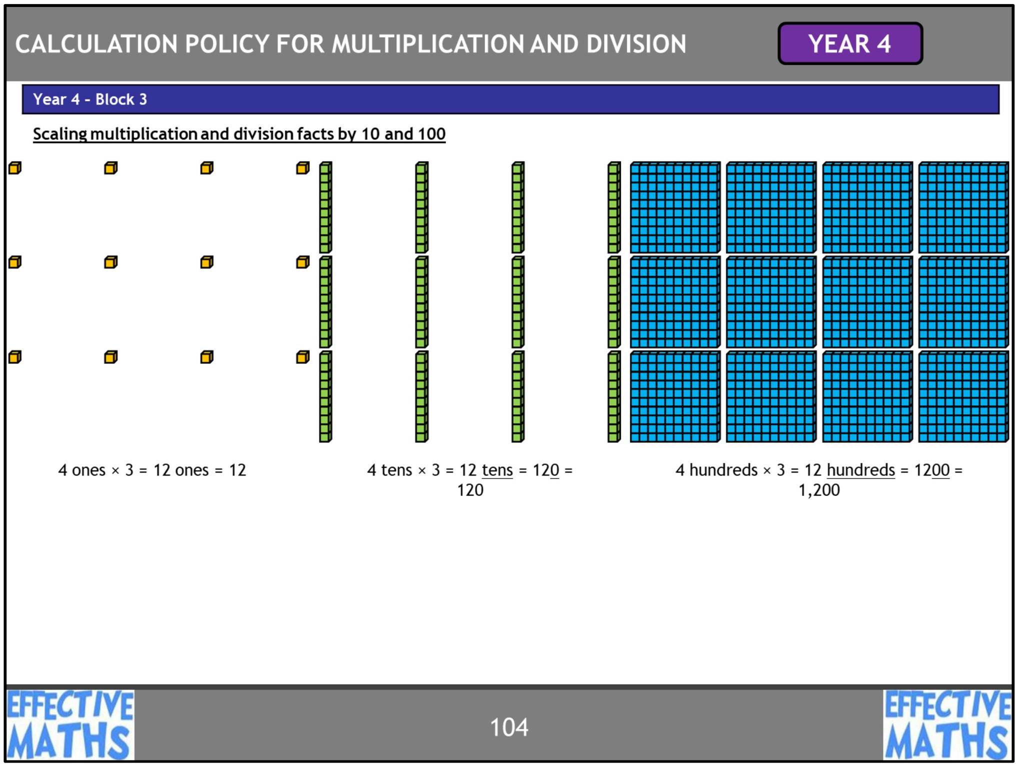


Dividing by partitioning and using short division
Children have used both methods previously. They are now applied to situations where the dividend is a 3-digit number. Initial examples partition the dividend in a standard way. For example, 927 is partitioned into 900 and 27 when being divided by 9. Later examples partition the dividend in a non-standard way, prioritising partitioning into multiples of the divisor. For example, 891 is partitioned into 810 and 81 when being divided by 9. Teaching makes connections between the methods.



BLOCK 3
CALCULATION UNIT

<u>Multiplying 3 numbers</u>
In Year 2 children learnt to add three 1-digit numbers and that the order they added them was not important because addition is commutative. By this stage in Year 4 they know that multiplication is also commutative and they learn to multiply three numbers. Arrays support conceptual understanding.
For example, the first array shows 3 × 2 where the '3' is the number of rows and the '2' is the number of rows. We have 4 lots of 3 × 2 resulting in 3 × 2 × 4.



Scaling multiplication and division facts by 10 and 100

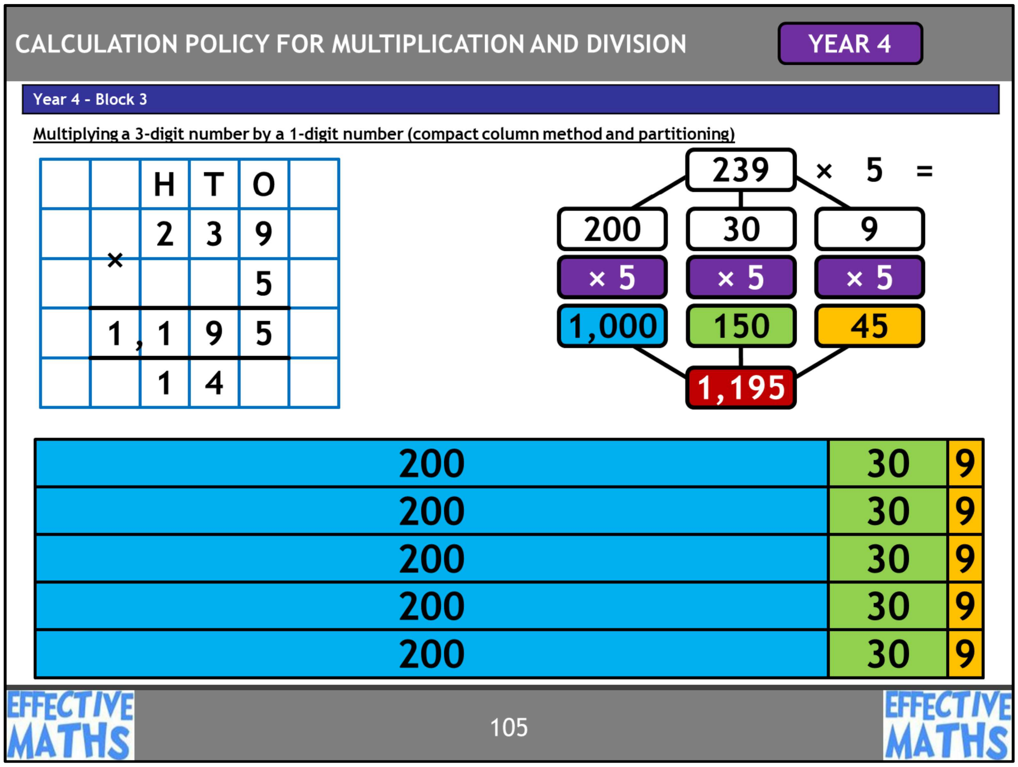
Children have had considerable experience with scaling number facts by ten and some previous experience of scaling facts by one hundred. For example, known addition and subtraction facts were scaled by one hundred in + and – unit 1. Some work on scaling by one hundred for multiplicative facts occurred in earlier × and ÷ units. By the end of Year 4 children should have increasingly good recall of multiplication facts and the associated division facts. They now combine these facts with unitising in hundreds. They learn that in scenarios like 400 × 3 they can use an anchor fact, 4 × 3 = 12.

Because one factor, 4, will be multiplied by 100, then the resulting product must also be multiplied by 100.

4 × 3 = 12 so 400 × 3 = 1,200

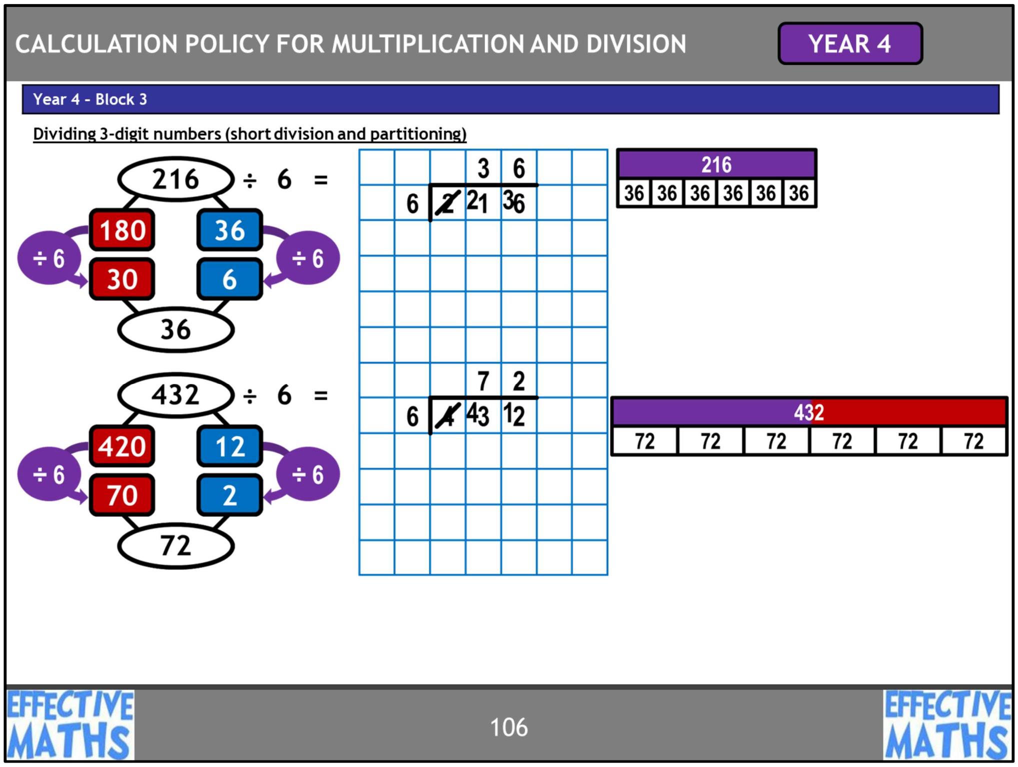
Accurate use of language is key to ensuring understanding. For example:

4 hundreds × 3 = 12 hundreds = 1200 = 1,200



Multiplying a 3-digit number by a 1-digit number (compact column method and partitioning)

Children consolidate understanding of the compact column method and revisit partitioning to secure multiplication of numbers with up to 3 digits. They do this within a problem solving approach and identify relationships between calculations.



Dividing 3-digit numbers (short division and partitioning)

Children consolidate understanding of the short division and revisit partitioning to secure division of numbers with up to 3 digits. They do this within a problem solving approach and identify relationships between calculations.