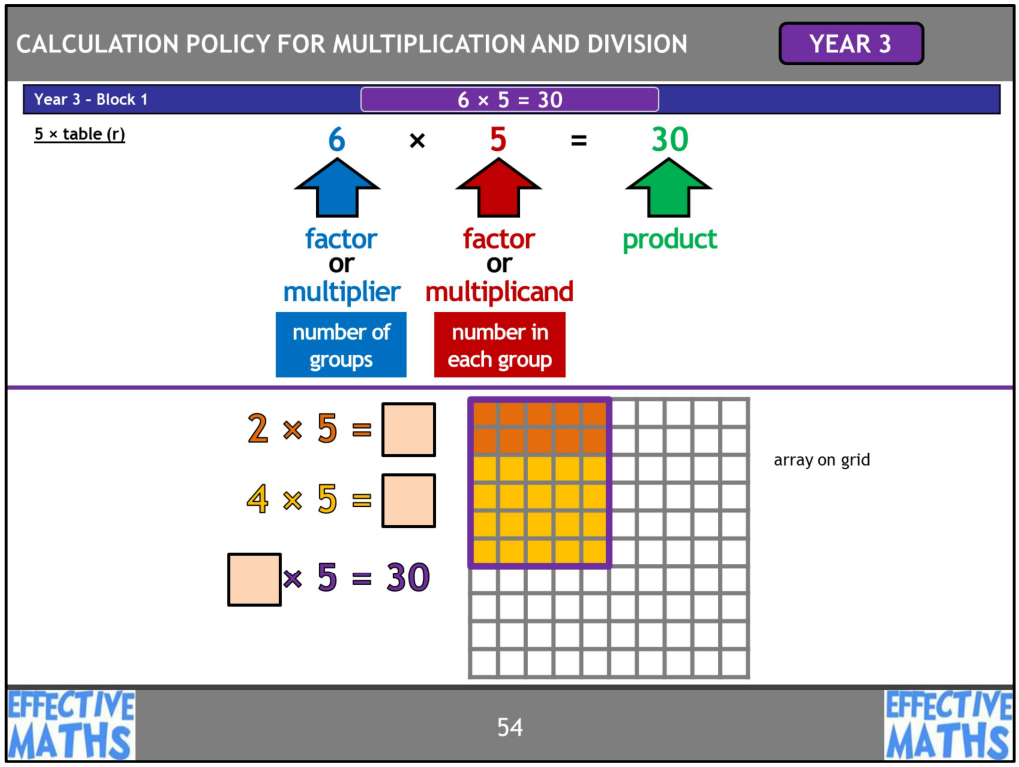
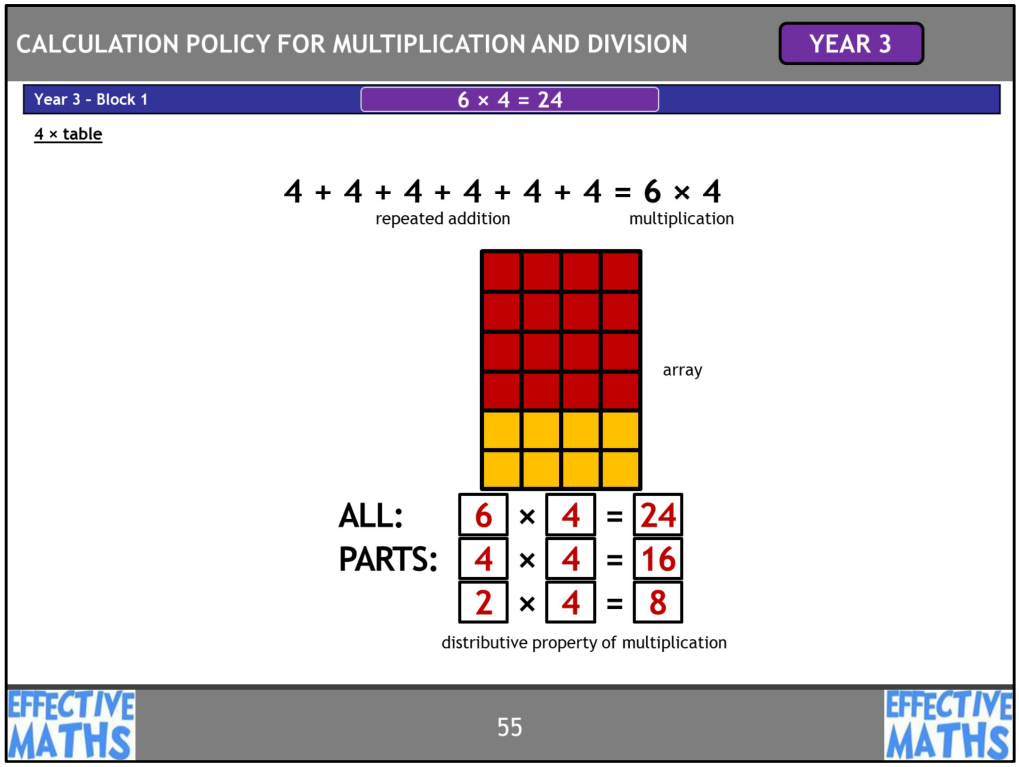


BLOCK 1
× AND ÷ UNIT 1

5 × table (r)
Block 1 begins by revisiting the 5 × table and introduces some new vocabulary to children (factor, multiplier, multiplicand and product). Children's understanding is deepened as they encounter arrays on blank multiplication grids. As learning progresses these arrays become partitioned and children are exposed to the distributive property of multiplication:
6 × 5 = **2** × 5 + **4** × 5.

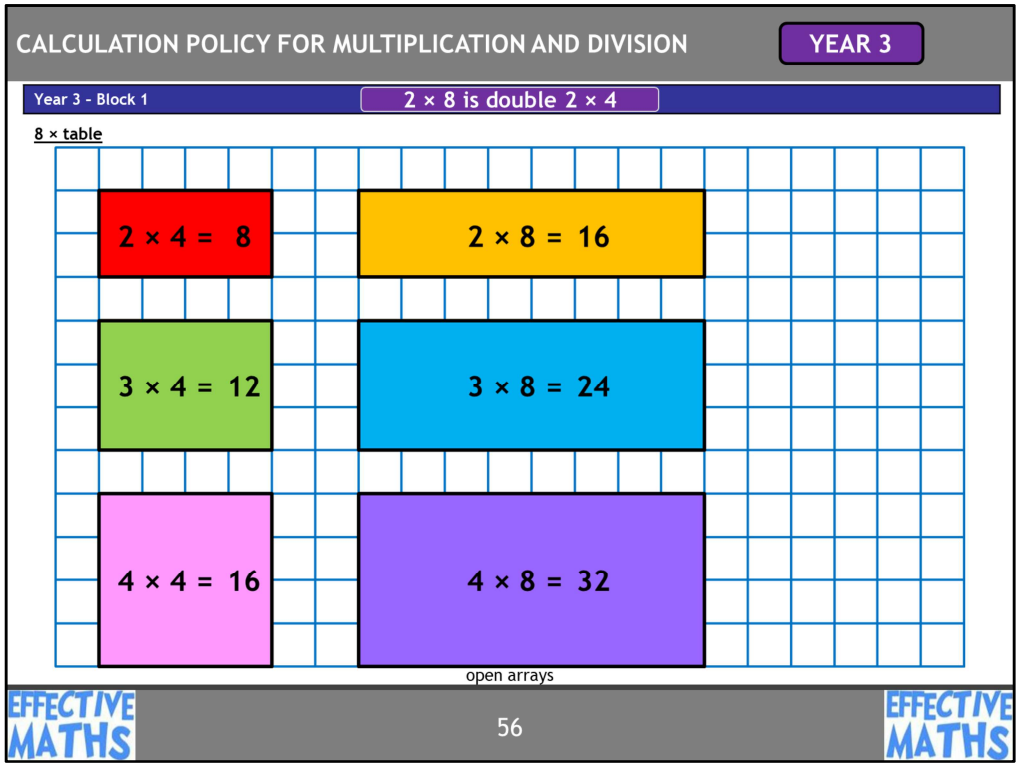
The distributive property allows a factor in a multiplication expression to be decomposed into two or more numbers, and those numbers can be multiplied by the other factor in the multiplication expression.



4 × table

Learning about the 4 × table also continues to make use of arrays. They revisit learning from Year 2 that whilst the repeated addition describes the arrays, 4 + 4 + 4 + 4 + 4 + 4 is not as efficient as 6 × 4. They learn that multiplication takes precedence over addition.

Children continue to be exposed to the distributive property of multiplication (not referred to as such) to deepen understanding about multiplication. For example:
6 × 4 = 24
4 × 4 = 16
2 × 4 = 8



8 × table

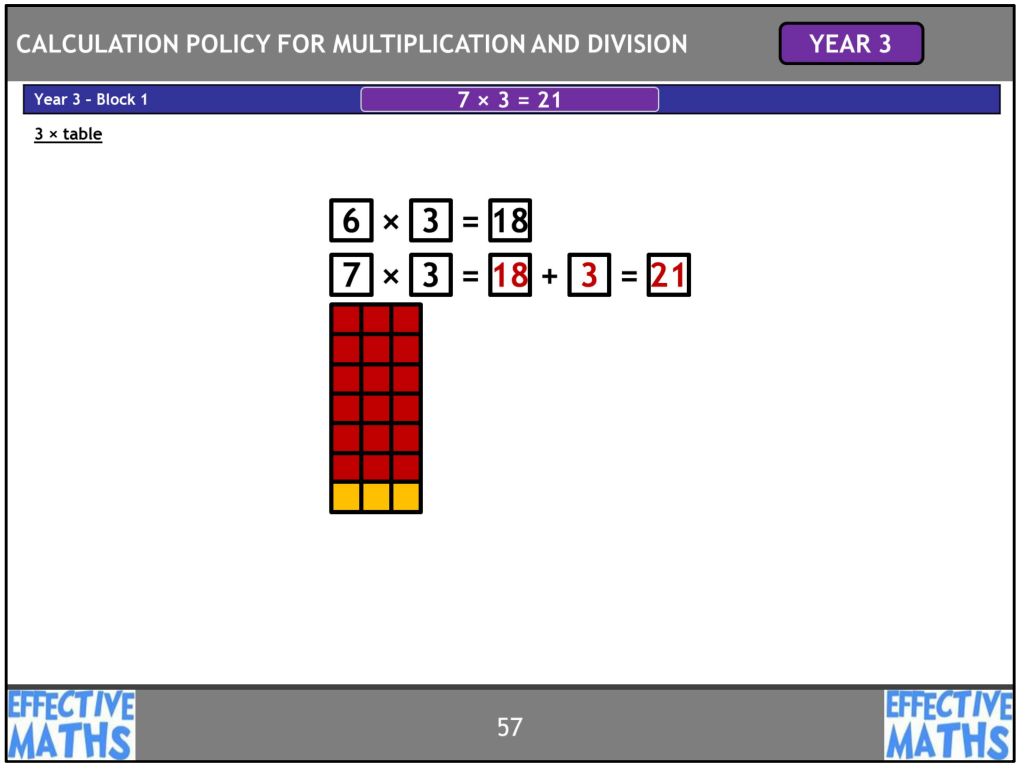
Learning the 8 × table makes links to children's developing knowledge of the 4 × table, eg:

2 × 4 = 8

2 × 8 = 16

Children continue to encounter arrays and are introduced to the open array. 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.

The challenge task in the 4 × table lesson involved exploring the pattern formed in the ones digits of the products. In the 8 × table lesson all children explore the pattern formed in the products of the 8 × table.

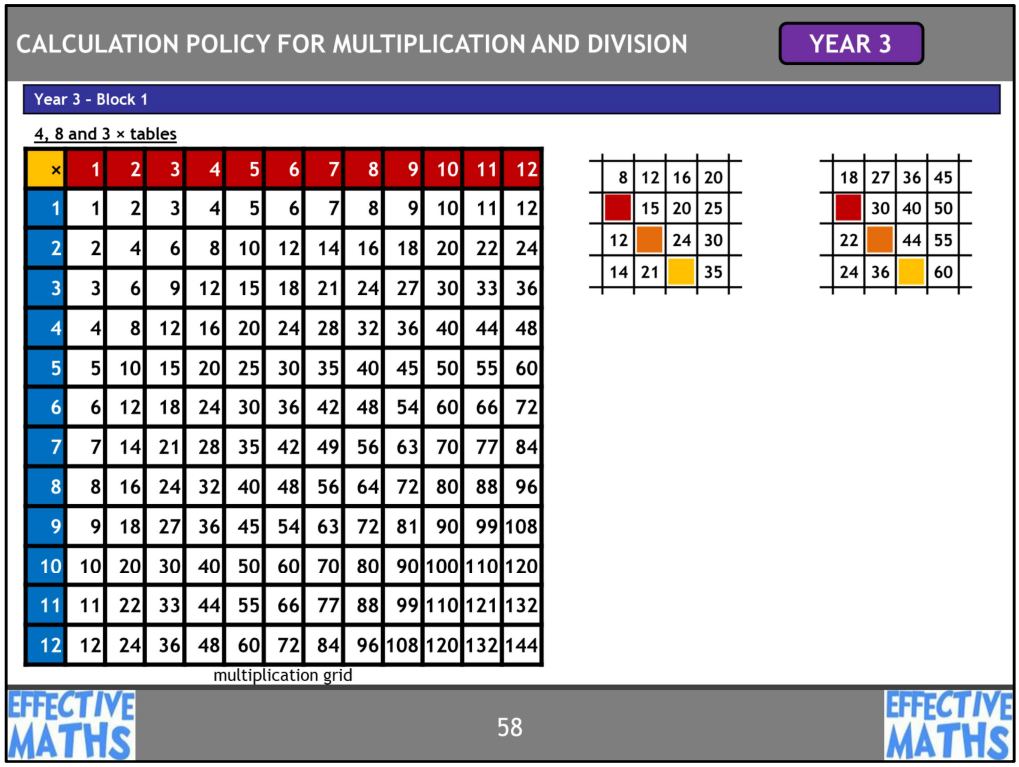


3 × table

The final multiplication table learnt in Year 3 is the 3 × table. The emphasis in learning here is to use a known fact to derive a new fact, eg:
6 × 3 = 18 so
7 × 3 = 18 plus one more lot of 3 = 21.
After children have been introduced to the 4, 8 and 3 multiplication tables teachers provide plenty of opportunities for these 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	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

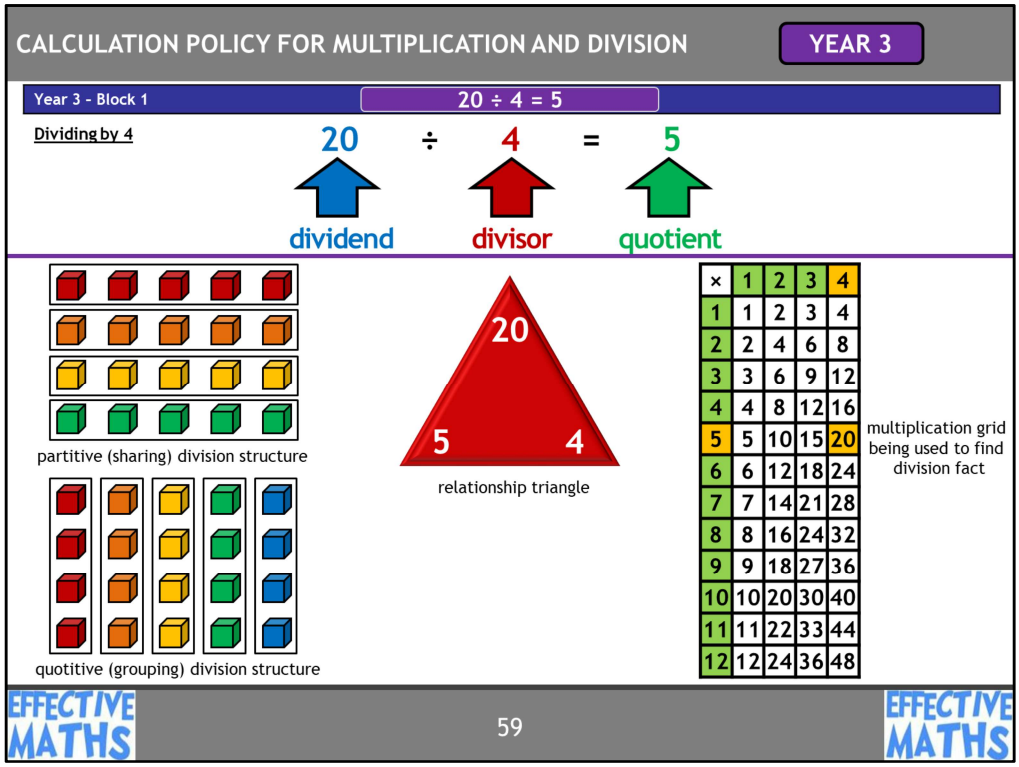
8	12	16	20
	15	20	25
12		24	30
14	21		35

18	27	36	45
	30	40	50
22		44	55
24	36		60

4, 8 and 3 × tables

A problem solving lesson concludes the work on multiplication facts.

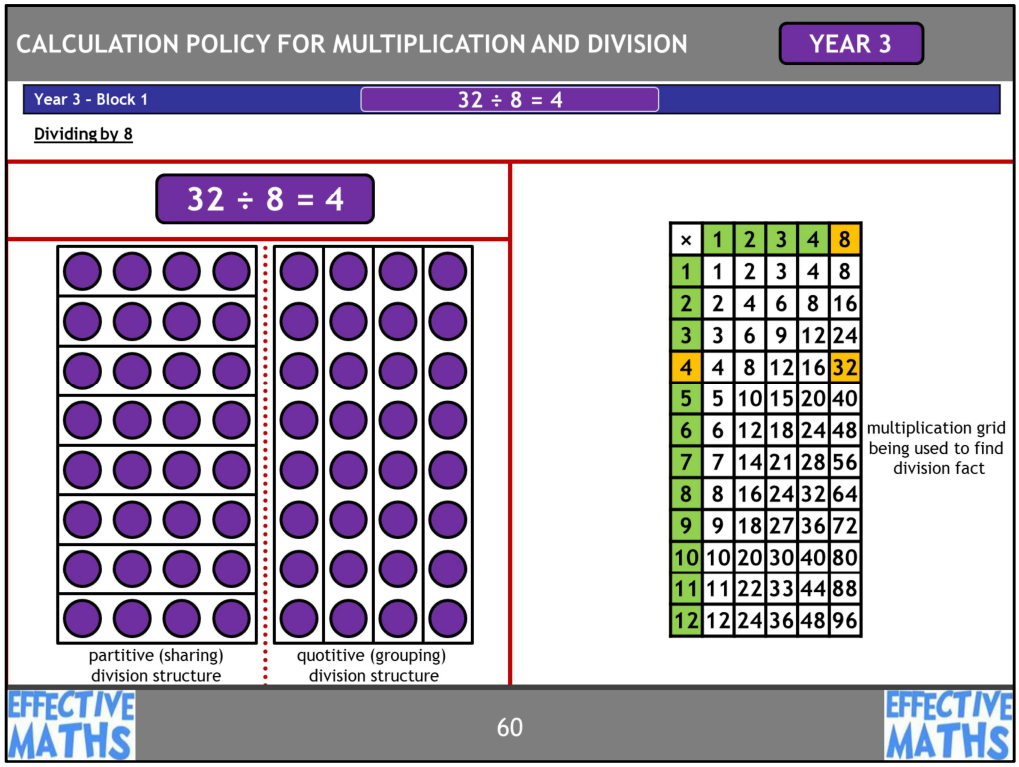
Children encountered the multiplication grid in Year 2. The problem solving lesson seeks to further develop children's understanding of the multiplication grid. They will need this knowledge for the division lessons where they will learn to use the multiplication grid to derive division facts. The division lessons begin with starter activities revisiting multiplication facts. One of the representations encountered in these activities is the multiplication grid.



×	1	2	3	4
1	1	2	3	4
2	2	4	6	8
3	3	6	9	12
4	4	8	12	16
5	5	10	15	20
6	6	12	18	24
7	7	14	21	28
8	8	16	24	32
9	9	18	27	36
10	10	20	30	40
11	11	22	33	44
12	12	24	36	48

Dividing by 4

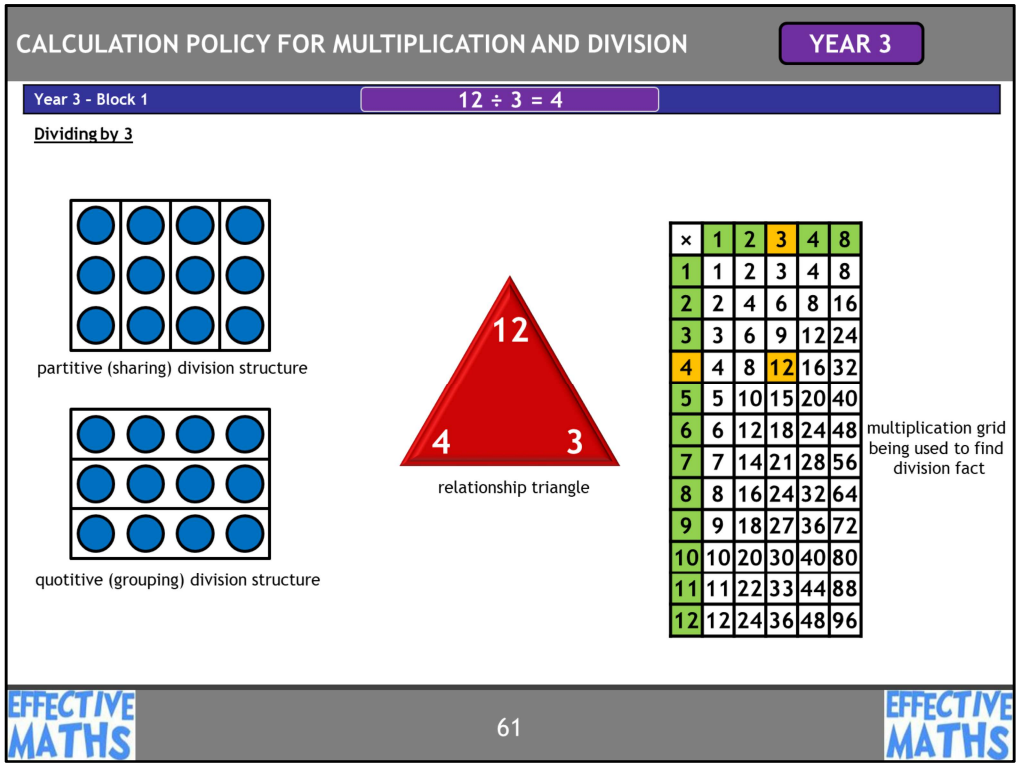
Learning to divide by 4 introduces some new vocabulary to children (dividend, divisor and quotient). In Year 2 children encountered two division structures, sharing and grouping. This continues in Year 3 and they interpret diagrams using both structures. Children should be familiar with the relationship triangle and these are used to promote links between multiplication facts and division facts. Teaching introduces children to using the multiplication grid to find division facts.



×	1	2	3	4	8
1	1	2	3	4	8
2	2	4	6	8	16
3	3	6	9	12	24
4	4	8	12	16	32
5	5	10	15	20	40
6	6	12	18	24	48
7	7	14	21	28	56
8	8	16	24	32	64
9	9	18	27	36	72
10	10	20	30	40	80
11	11	22	33	44	88
12	12	24	36	48	96

Dividing by 8

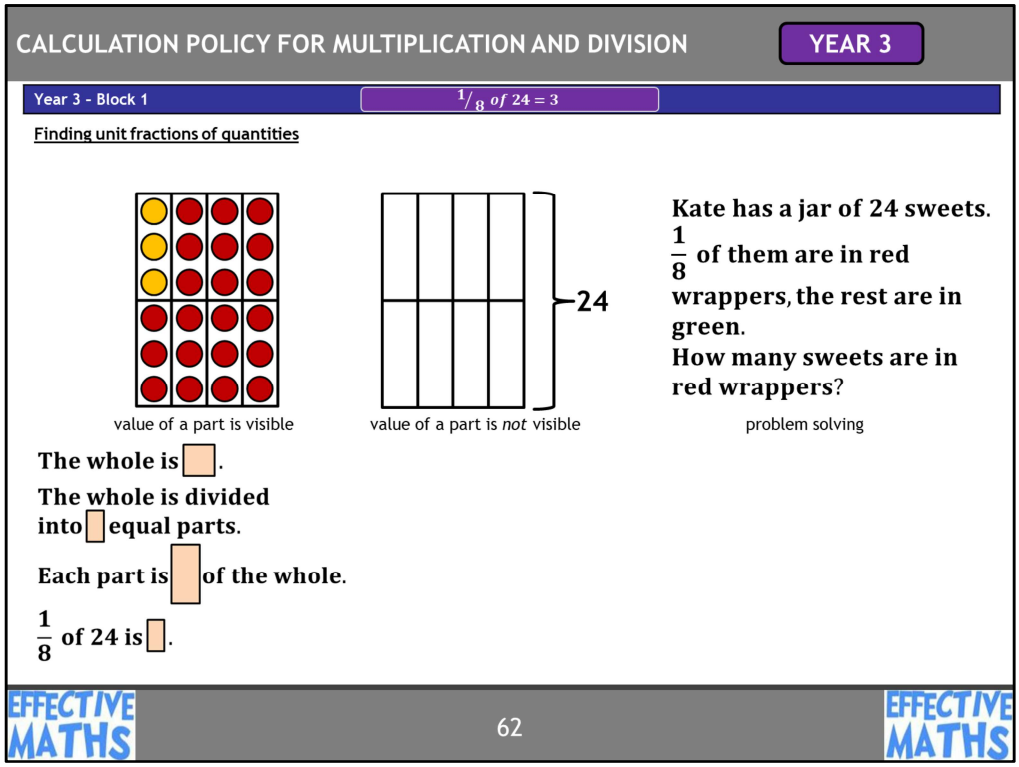
Learning to divide by 8 continues to develop understanding of sharing and grouping. Children are encouraged to make direct comparisons between the two structures. They continue to use the multiplication grid to find division facts.



×	1	2	3	4	8
1	1	2	3	4	8
2	2	4	6	8	16
3	3	6	9	12	24
4	4	8	12	16	32
5	5	10	15	20	40
6	6	12	18	24	48
7	7	14	21	28	56
8	8	16	24	32	64
9	9	18	27	36	72
10	10	20	30	40	80
11	11	22	33	44	88
12	12	24	36	48	96

Dividing by 3

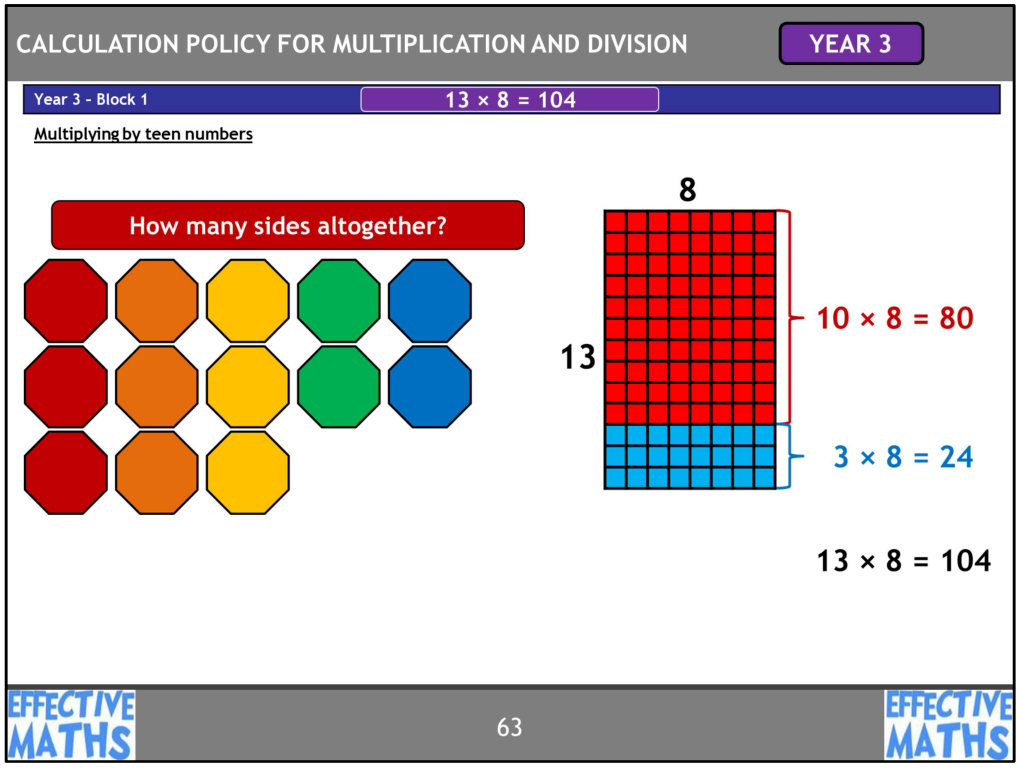
The final lesson of the unit focuses on dividing by 3. The concepts (sharing and grouping) and representations (arrays, relationship triangles and multiplication grids) should be familiar to the children.



BLOCK 1
FRACTIONS UNIT 1

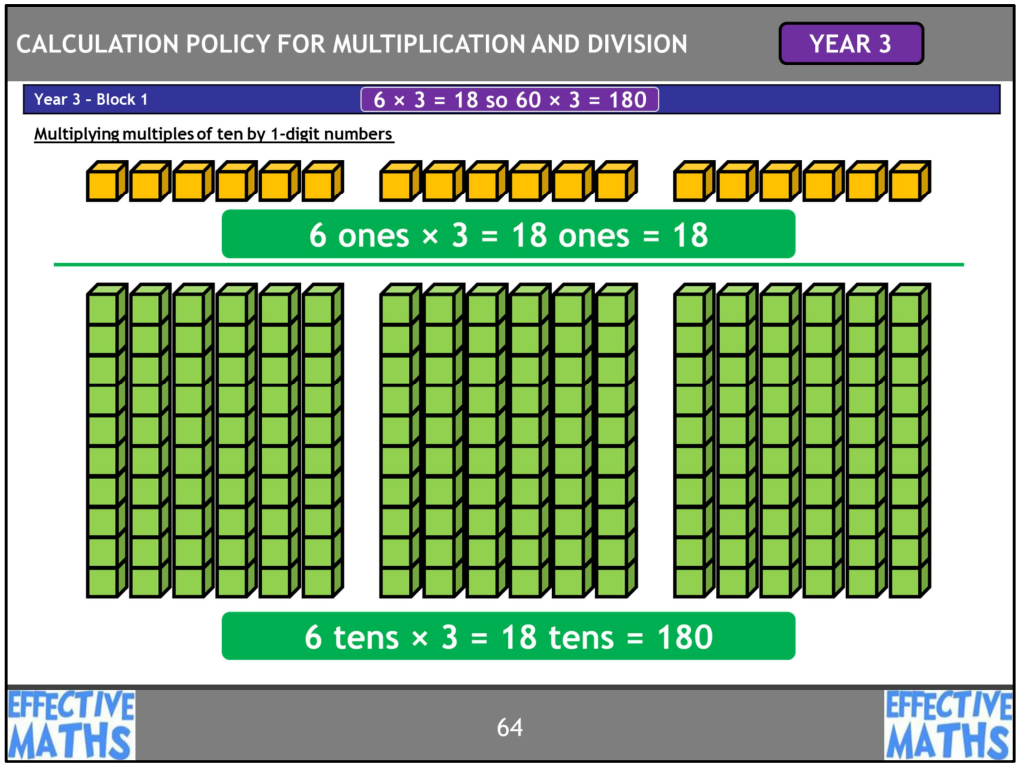
Finding unit fractions of quantities

Children have had lots of experience finding halves, thirds and quarters from Year 2 and earlier in the Year 3 fractions unit. That experience is now extended to finding fifths, eighths and tenths (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 where the value of a part cannot be seen.



BLOCK 1
× AND ÷ UNIT 2

Multiplying by teen numbers
Children have considerable experience of partitioning arrays to derive multiplication facts within the multiplication tables. This is now extended to derive facts beyond the multiplication tables, using facts from within them.



Multiplying multiples of ten by 1-digit numbers

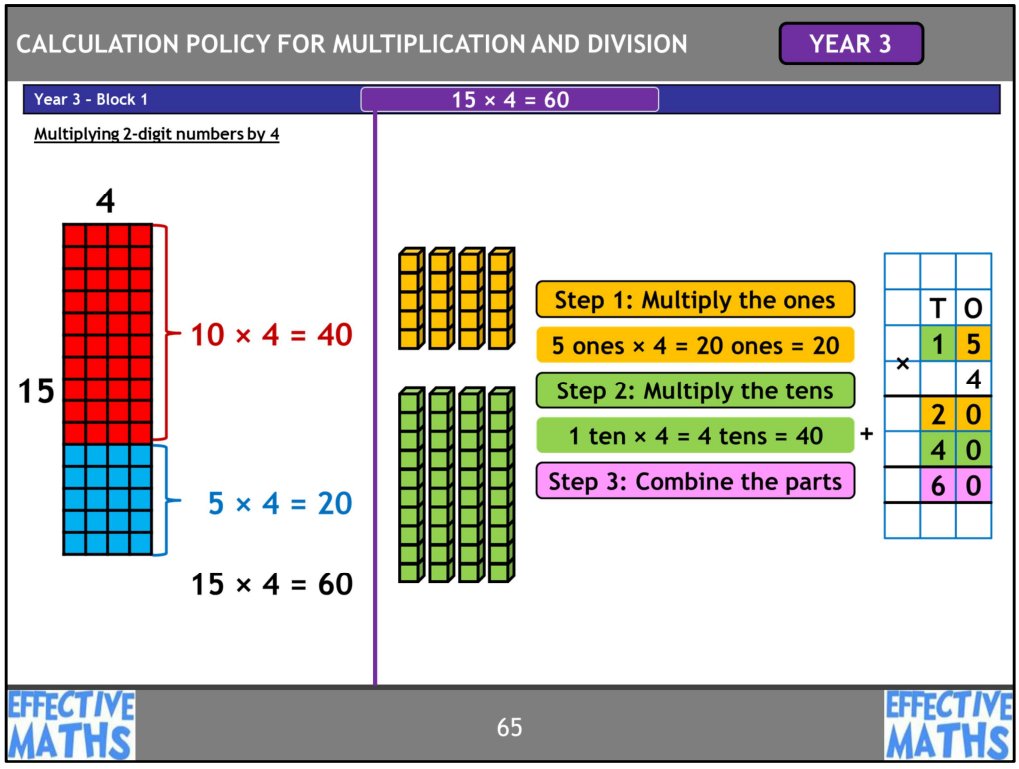
Scaling is used to derive new multiplication facts from known facts. For example:

6 × 3 = 18

60 × 3 = 6 tens × 3 = 18 tens = 180

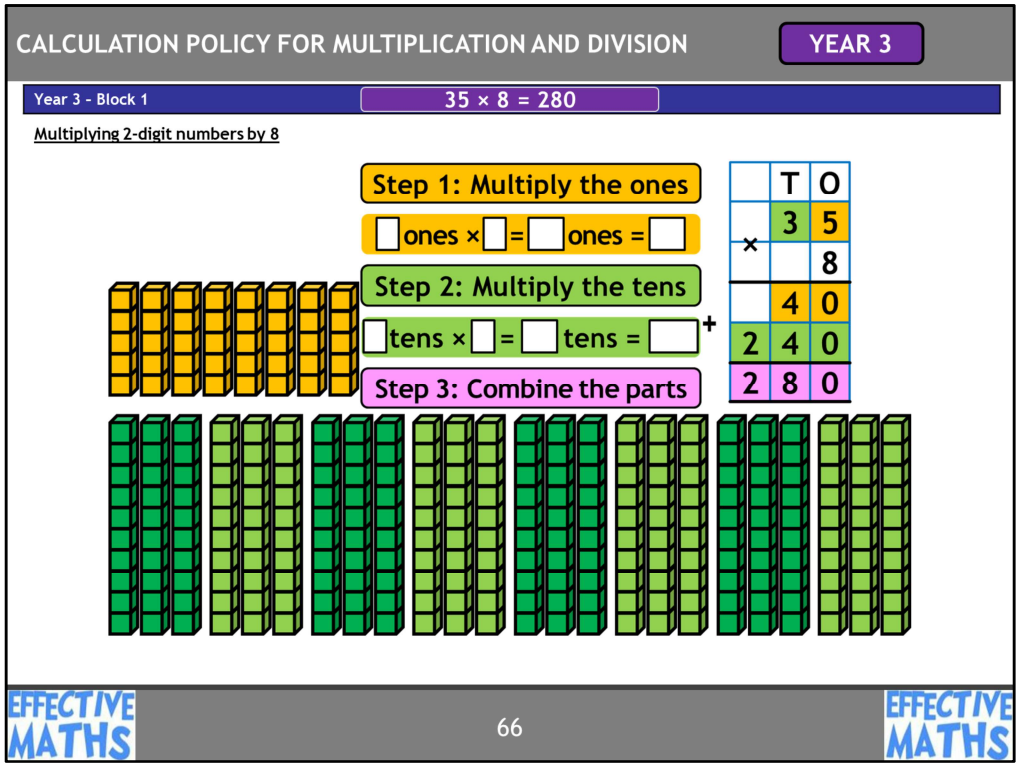
Base ten is used to support conceptual understanding.

As you say '18 tens' it is useful to write 180 (underlining the zero as you say 'tens'). Then read 18 tens/180 as one hundred and eighty/180.



Multiplying 2-digit numbers by 4

Learning from the previous two steps, multiplying teen numbers and multiplying multiples of ten, is used to introduce children to the expanded column method for multiplication. This is done by solving a calculation using a known method (partitioning an array), then solving the same calculation with base 10 blocks and finally using the expanded column method. Teaching makes connections between all three representations.



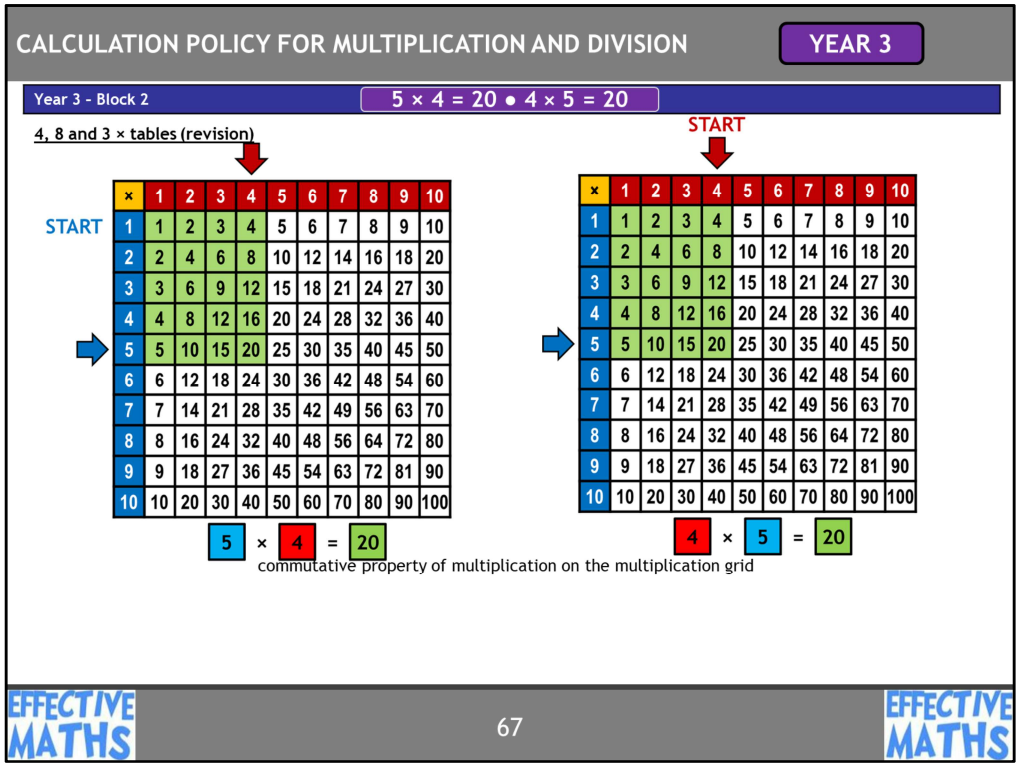
Multiplying 2-digit numbers by 8

Arrays continue to support understanding, but the emphasis moves more towards base 10 supporting understanding of the expanded column method.

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

5 ones × 8 = 40 ones = 40

3 tens × 8 = 24 tens = 240



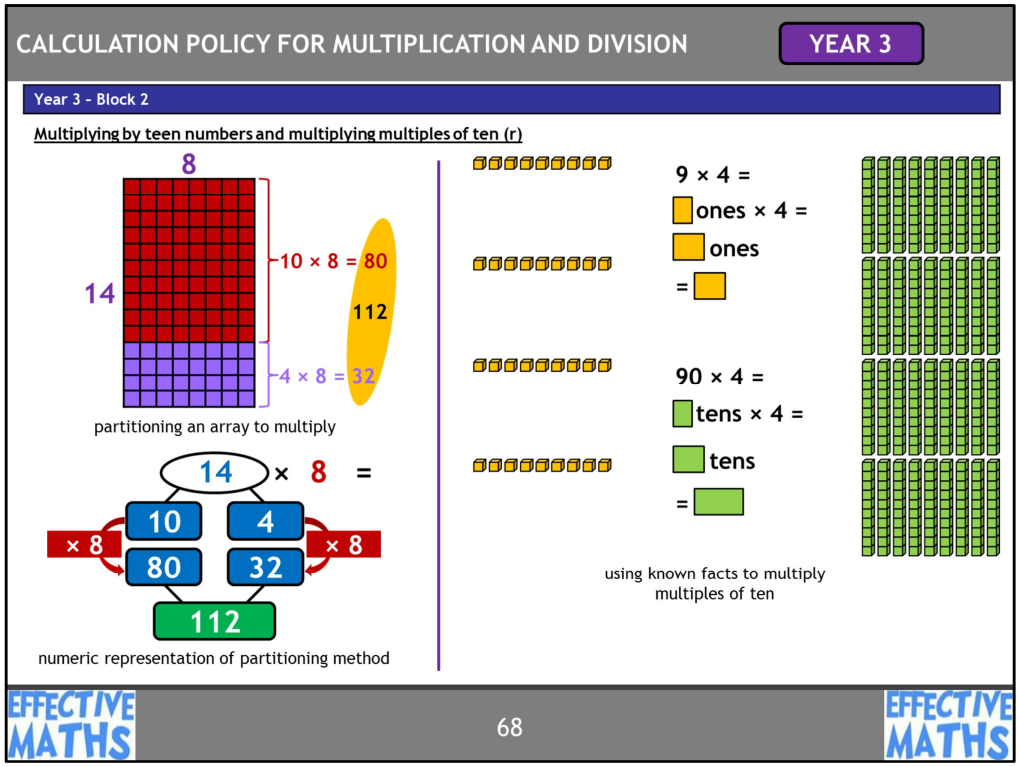
BLOCK 2
× AND ÷ UNIT 3

4, 8 and 3 × tables (revision)

× and ÷ Unit 3 begins with revision of the 4, 8 and 3 × tables. No new representations are encountered. Teaching stresses the commutative nature of multiplication and shows how we obtain the same product regardless of the order of the factors.

The multiplication grid may look a bit like a 100 square, but it works in a very different way. The multiplication grid is actually arrays. The first grid shows 5 rows of 4. The second shows 4 columns of 5.

Children continue to be exposed to the distributive property of multiplication (not referred to as such) to deepen understanding about multiplication. For example: 10 × 3 + 2 × 3 = 12 × 3.

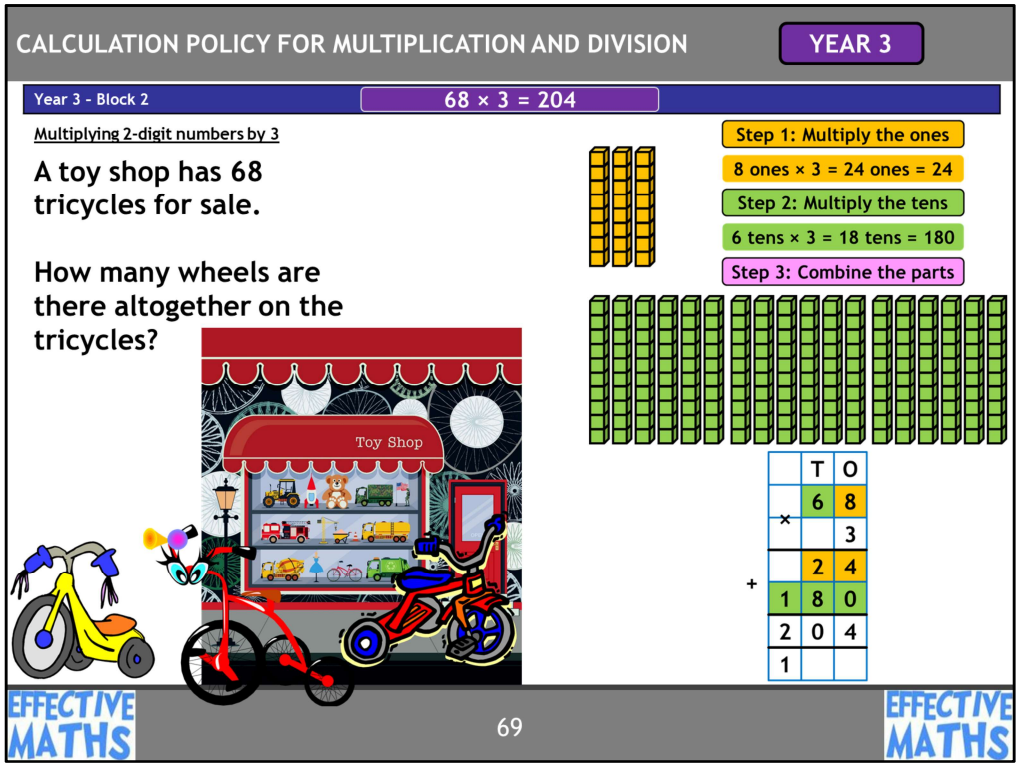


Multiplying by teen numbers and multiplying multiples of ten (r)

× and ÷ Unit 2 introduced multiplying by teen numbers: finding facts beyond the multiplication tables, using facts from within them. Arrays supported conceptual understanding.

Unit 3 introduces a numeric representation to support conceptual understanding of the partitioning method.

Children consolidate their understanding of multiplying multiples of ten.



Multiplying 2-digit numbers by 3

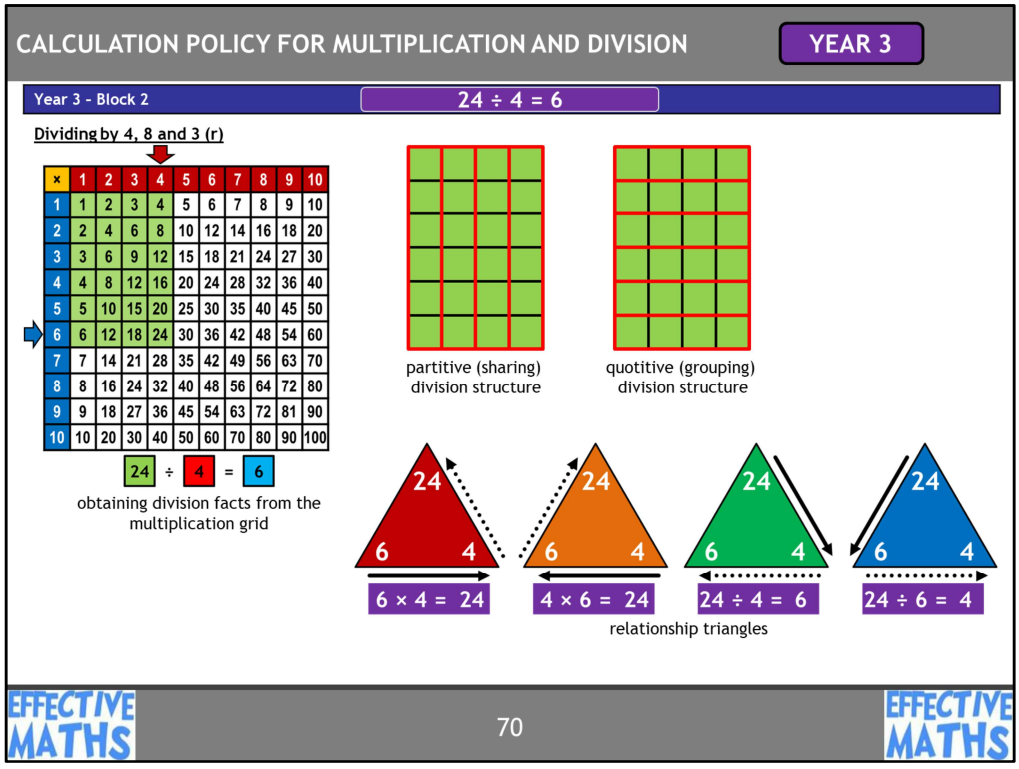
× and ÷ Unit 2 introduced the expanded column method to multiply 2-digit numbers by 4 and 8. (These are multiplication tables children typically have better recall of than the 3 × table.)

Multiplying 2-digit numbers by 3 is introduced in Unit 3. Base 10 supports understanding of the expanded column method.

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

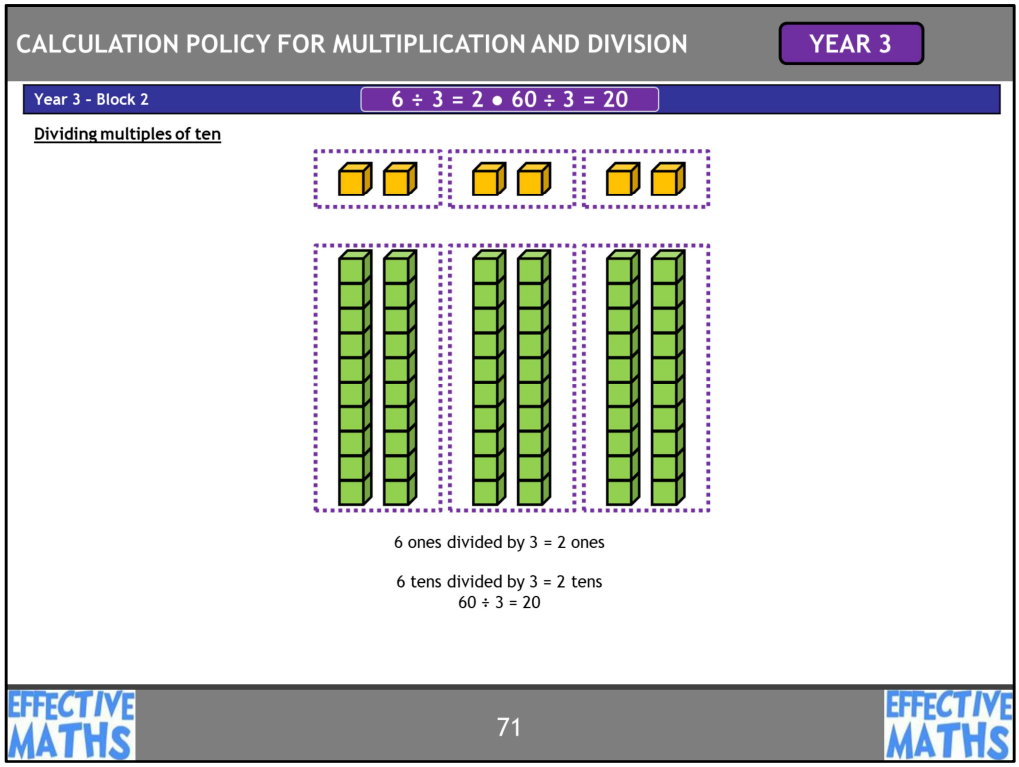
8 ones × 3 = 24 ones = 24

6 tens × 3 = 18 tens = 180



Dividing by 4, 8 and 3 (r)

The second half of the unit focuses on division and begins with revision of division facts linked to the 4, 8 and 3 × tables. Children are reminded how to use the multiplication grid to obtain division facts and about the sharing/grouping structures for division. Relationship triangles reinforce the connections between multiplication and division. Children solve problems involving division facts linked to the 4, 8 and 3 × tables.



Dividing multiples of ten

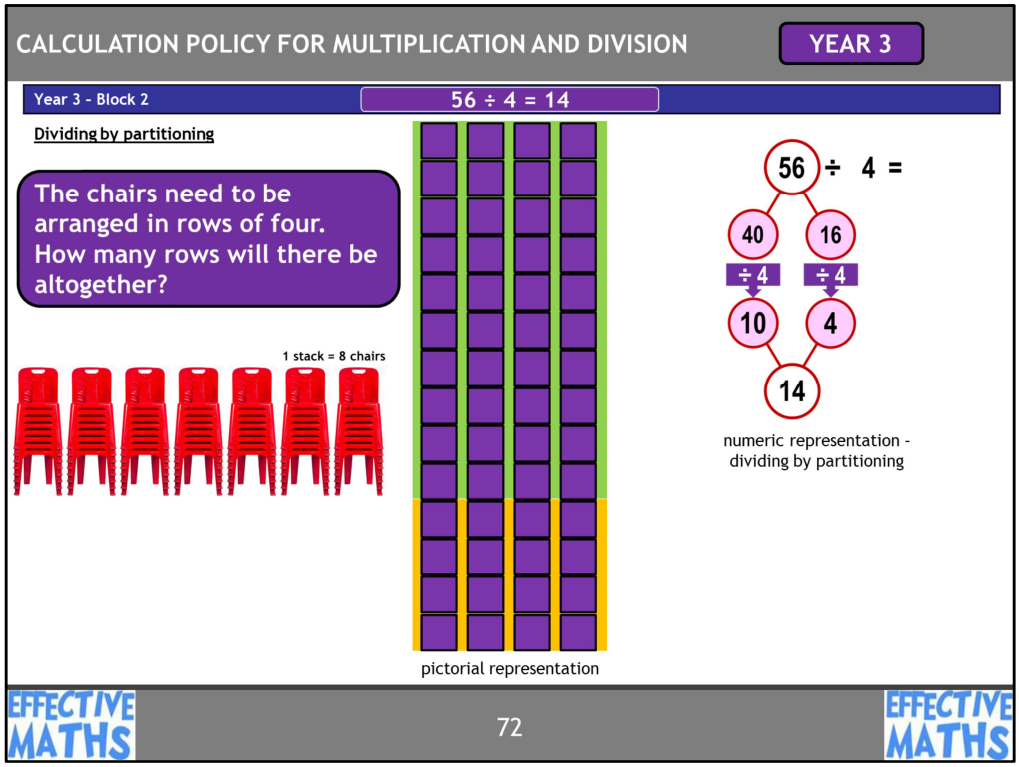
Children have experienced using known facts in unit 2 (and earlier in this unit) when they multiplied multiples of ten. They now use scaling for division facts derived from multiplication tables.

Use of language is key.

6 ones divided by 3 = 2 ones

6 tens divided by 3 = 2 tens

60 ÷ 3 = 20



Dividing by partitioning

Children's experience of division now extends to situations where the dividend is not in the multiplication tables they know. They learn to partition the dividend into multiples of the divisor. In the case of 56 ÷ 4 one way to partition 56 would be 40 and 16. Each part is then divided by 4 and the resulting quotients combined.

56 ÷ 4 =

40 ÷ 4 + 16 ÷ 4 =

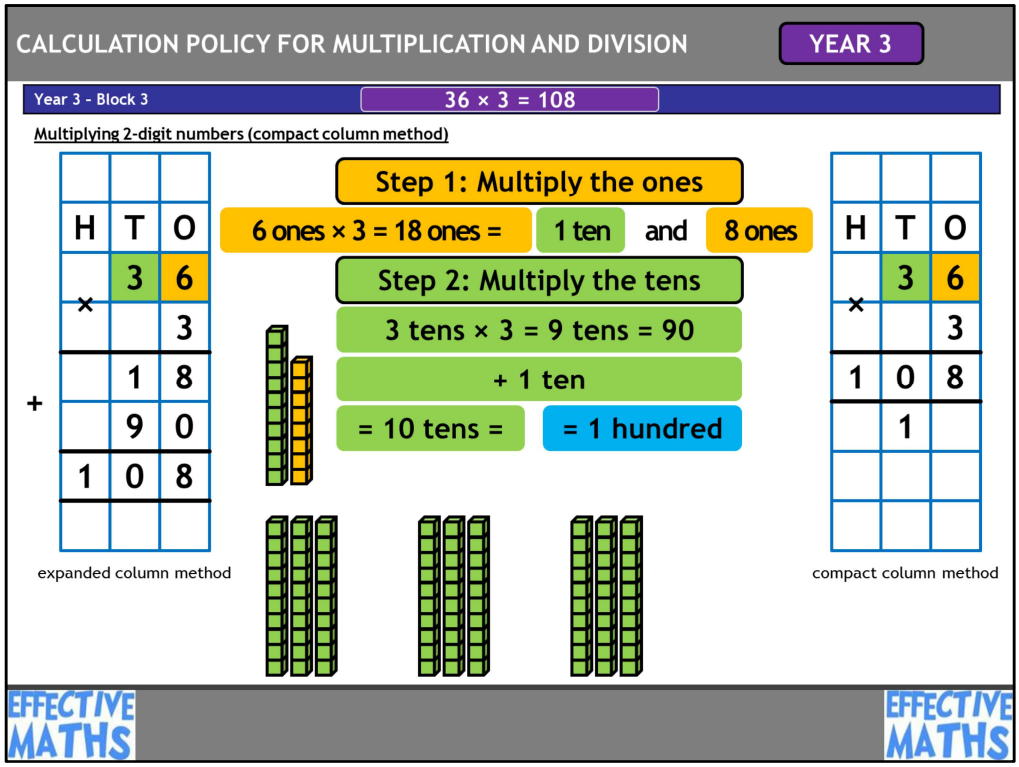
10 + 4 = 14

Clearly the dividend can be partitioned into any multiples of the divisor.

56 ÷ 4 =

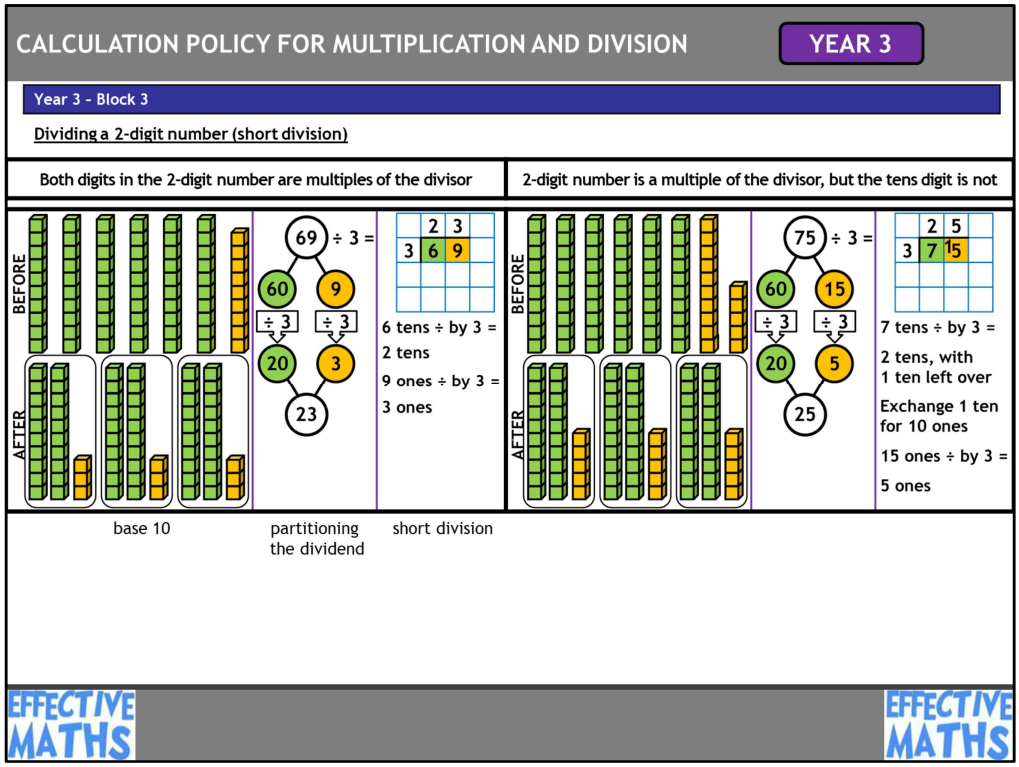
20 ÷ 4 + 36 ÷ 4 =

5 + 9 = 14



BLOCK 3
CALCULATION UNIT

Multiplying 2-digit numbers (compact column method)
Children have multiplied numbers by using partitioning, including representing this partitioning with the expanded column method. Arrays and base ten representations support conceptual understanding as the compact column method is introduced. The use of language is key to ensure conceptual understanding, particularly around the exchanging of ones for tens.
Language for 36 × 3
6 ones × 3 = 18 ones = 1 ten and 8 ones.
3 tens × 3 = 9 tens + the 1 ten = 10 tens = 1 hundred.



Dividing a 2-digit number (short division)

Children have experience of division facts linked to the multiplication tables they know and also of using partitioning to divide. They are now introduced to the formal algorithm for short division. The following sequence is followed:

- both digits in a 2-digit number are multiples of the divisor (eg 69 ÷ 3);
- 2-digit number is a multiple of the divisor, but the tens digit is not (eg 75 ÷ 3).

Base 10 and the partitioning method support conceptual understanding.

Using base 10 for 75 ÷ 3

Share the 6 of the tens equally between three groups.
You have one ten left over. It cannot be shared, so say:
Let's exchange 1 ten for 10 ones. Now we have 15 ones.
Share the 15 ones equally between the three groups.

Using partitioning for 75 ÷ 3

Partition 75 into parts that are divisible by 3, highlighting that those parts are 60 and 15 not 70 and 5.
Divide each part by 3.
Combine the parts to obtain 25.

Using short division for 75 ÷ 3

Write the dividend (75) and then draw the frame.
Write the divisor on the left of the dividend.
Say:
7 tens ÷ by 3 = 2 tens with 1 ten left over.
Exchange 1 ten for 10 ones.
15 ones divided by 3 = 5 ones