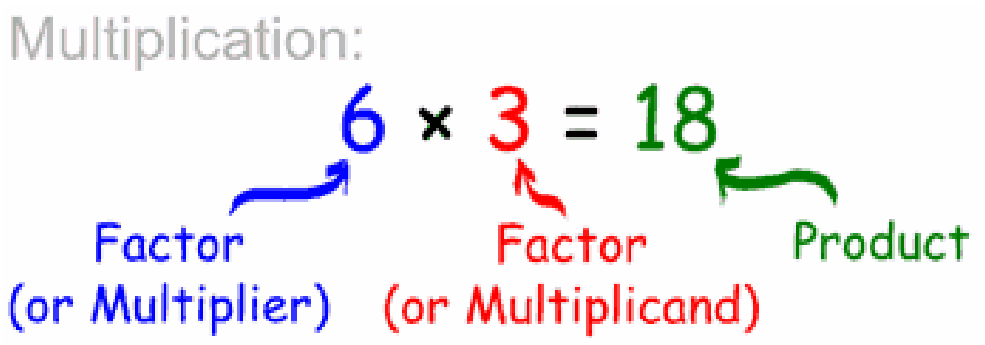
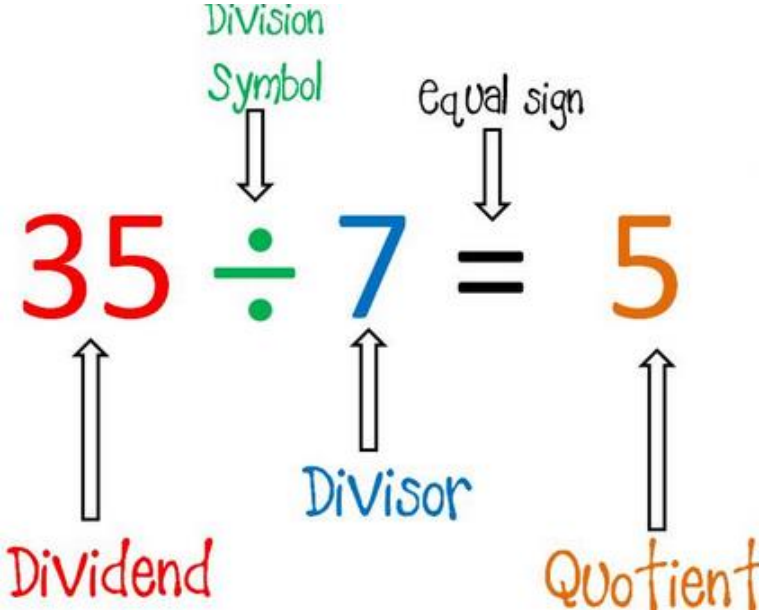
Thomas Buxton Multiplication and Division Calculation Policy

Images taken from Power Maths and NCETM
Policy created June 2021.

Teaching and Modelling Specific Vocabulary





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EYFS	
Early Learning Goals- Number	• Have a deep understanding of number to 10, including the composition of each number • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts
Early Learning Goals- Numerical Patterns	• Verbally count beyond 20, recognising the pattern of the counting system • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally
Year 1	
Year 1 Multiplication and Division Vocabulary	Equal, groups, array, row, column, double, twice, group, part-whole model, whole, part, number sentence, odd, even, count in twos, threes, fives, count in tens (forwards from/backwards from) How many times? Lots of, groups of, once, twice, three times, five times, repeated addition, share, share equally, double, halve, groups (pairs, threes, fives), divide, multiply, left, left over
National Curriculum Year 1 Multiplication and Division objectives	• Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher
Year 1 Multiplication	
Recognising and making equal groups: Children arrange objects in equal and unequal groups and understand how to recognise whether they are equal. They can then progress to drawing and representing equal and unequal groups.	

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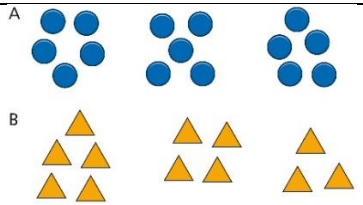
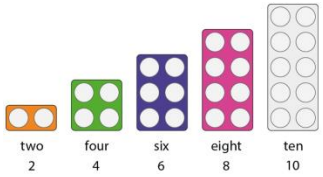
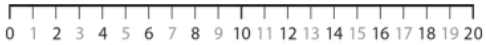


Finding the total of equal groups by counting in 2s, 5s and 10s: Children can initially start by arranging concrete objectives and then move onto pictorial resources by circling groups.

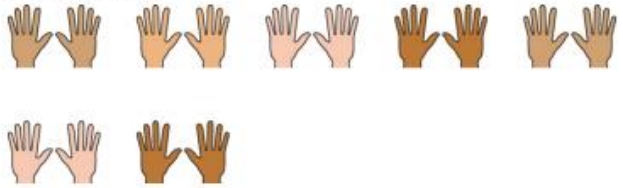


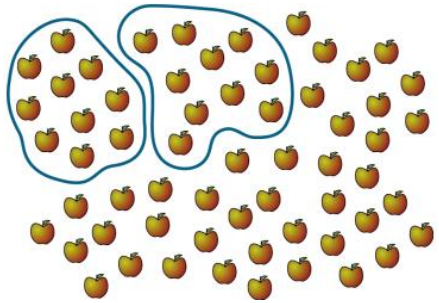
Skip counting in twos/counting even numbers – number line:



- *'How many wheels are there? Count in groups of two.'*

'How many fingers (and thumbs) are there? Count in groups of ten.'





	Year 1 Division

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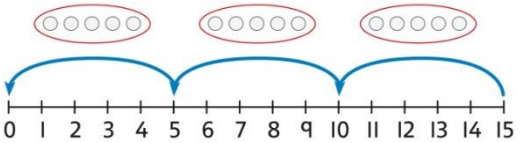
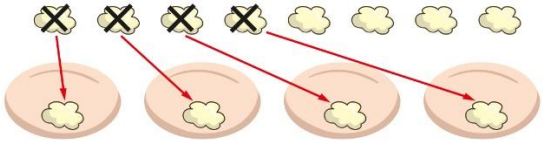
Grouping: Learn to make equal groups from a whole and find how many equal groups of a certain size can be made. Sort a whole set people and objects into equal groups.

There are 10 children altogether.
There are 2 in each group.
There are 5 groups.

There are 10 in total.
There are 5 in each group.
There are 2 groups.



Sharing: Share a set of objects into equal parts and work out how many are in each part**.**



Year 2	
Year 2 Multiplication and Division Vocabulary	Equal, groups, array, row, column, double, twice, group, part-whole model, whole, part, number sentence, odd, even, count in twos, threes, fives, count in tens (forwards from/backwards from) How many times? Lots of, groups of, once, twice, three times, five times, repeated addition, share, share equally, double, halve, groups (pairs, threes, fives), divide, multiply, left, left over, partition
National curriculum Year 2 Multiplication and Division objectives	• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x) and division ( ) and equals (=) signs

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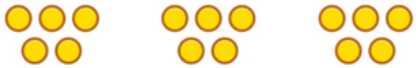
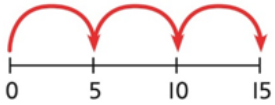
	• Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.

Year 2 Multiplication

Equal groups and repeated addition: Recognise equal groups using standard objects such as counters and write as repeated addition and multiplication. Use a number line and write as repeated addition and as multiplication.



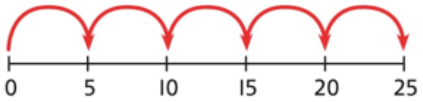
3 groups of 5
15 in total



5 + 5 + 5 = 15
3 × 5 = 15

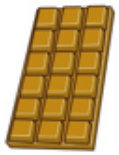
Using arrays to represent multiplication and support understanding: Understand the relationship between arrays, multiplication and repeated addition.

4 groups of 5



5 × 5 = 25

Understanding commutativity: Form arrays using counters to visualise commutativity. Rotate the array to show that orientation does not change the multiplication.



I can see 6 groups of 3.
I can see 3 groups of 6.

This is 2 groups of 6 and also 6 groups of 2.

4 + 4 + 4 + 4 + 4 = 20
5 + 5 + 5 + 5 = 20
4 × 5 = 20 and 5 × 4 = 20

Year 2 Division

Sharing equally: Start with a whole and share into equal parts, one at a time.

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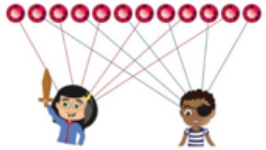
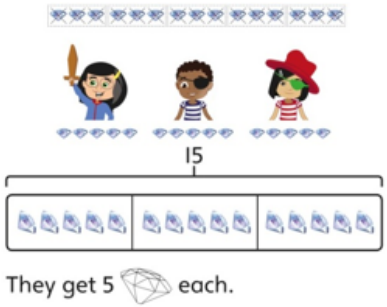


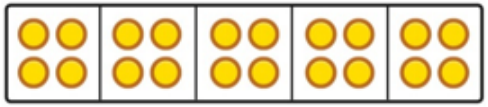
12 shared equally between 2.
They get 6 each.

Start to understand how this also relates to grouping. To share equally between 3 people, take a group of 3 and give 1 to each person. Keep going until all the objects have been shared



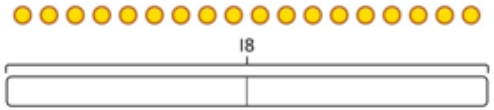
15 shared equally between 3.
They get 5 each.

Represent the objects shared into equal parts using a bar model.



20 shared into 5 equal parts.
There are 4 in each part.

Use a bar model to support understanding of the division.



18 ÷ 2 = 9

Grouping equally: Understand how to make equal groups from a whole. Ensure children understand the relationship between grouping and division statements. Finally children should make the relationship between division by grouping to repeated subtraction.

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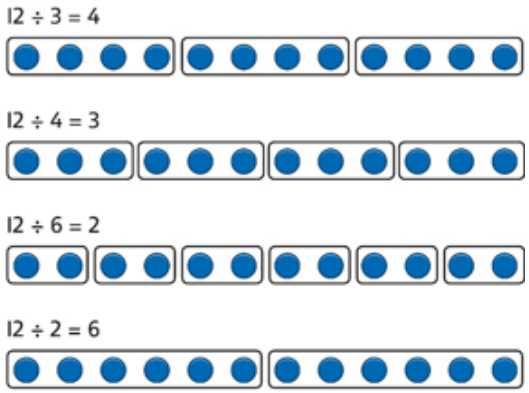
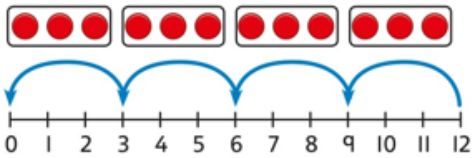
8 divided into 4 equal groups.
There are 2 in each group.



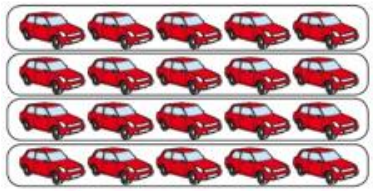


There are 4 groups now.

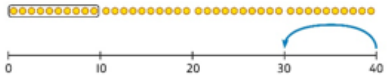
12 divided into groups of 3.
12 ÷ 3 = 4

There are 4 groups.

Using known times-tables to solve divisions: Ensure the relationship between multiplication facts and division is made clear. Link equal grouping with repeated subtraction and use known times-table facts to support division.

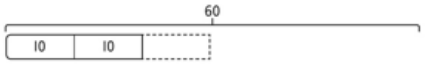


4 groups of 5 cars is 20 cars in total.
20 divided by 4 is 5.



40 divided by 4 is 10.

Use a bar model to support understanding of the link between times-table knowledge and division.



1 × 10 = 10
2 × 10 = 20
3 × 10 = 30
4 × 10 = 40
5 × 10 = 50
6 × 10 = 60
7 × 10 = 70
8 × 10 = 80

I used the 10 times-table to help me. 3 × 10 = 30.

I know that 3 groups of 10 makes 30, so I know that 30 divided by 10 is 3.

3 × 10 = 30 so 30 ÷ 10 = 3

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Year 3	
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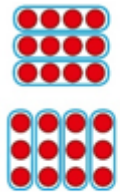
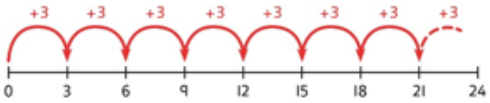
National curriculum Year 3 Multiplication and Division objectives	• Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods • Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which *n* objects are connected to *m* objects.

Year 3 Multiplication

Understanding equal grouping and repeated addition: Children continue to build understanding of equal groups and the relationship with repeated addition. Use objects to consolidate examples and non-examples. Arrays should be used to demonstrate commutativity. Children should be shown the link between repeated addition and multiplication.



This is 3 groups of 4.
This is 4 groups of 3.



8 groups of 3 is 24.

3 + 3 + 3 + 3 + 3 + 3 + 3 + 3 = 24
8 × 3 = 24
A bar model may represent multiplications as equal groups.

6 × 4 = 24

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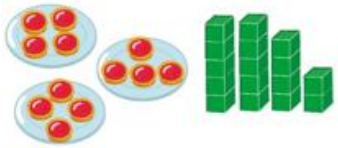
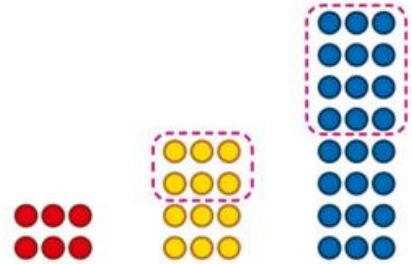


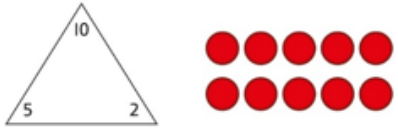
Children recognise that arrays can be used to model commutative multiplications.

I can see 3 groups of 8.
I can see 8 groups of 3.

Understanding and using ×3, ×2, ×4 and ×8 tables: Children learn the times-tables as 'groups of', but apply their knowledge of commutativity. Pupils are able to explore how the x2, x4 and x8 tables are related through repeated doubling. They also understand the relationship between related multiplication and division facts in known times-tables.

I can use the ×3 table to work out how many keys.
I can also use the ×3 table to work out how many batteries.





2 × 5 = 10
5 × 2 = 10
10 ÷ 5 = 2
10 ÷ 2 = 5

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Multiplying a 2-digit number by a 1-digit number: Understand how to link partitioning a 2-digit number with multiplying using objects. Continue to use place value to support partitioning with multiplying.

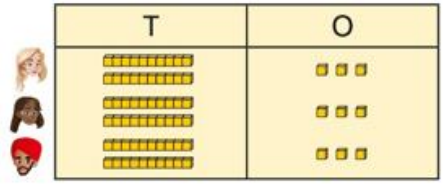
Each person has 23 flowers.

Each person has 2 tens and 3 ones.

There are 3 groups of 2 tens.

There are 3 groups of 3 ones.

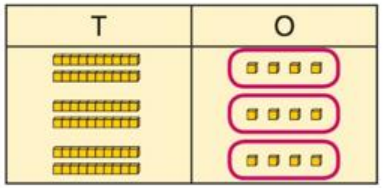
Use place value equipment to model the multiplication context.



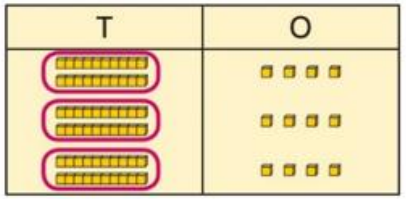
There are 3 groups of 3 ones.

There are 3 groups of 2 tens.

3 × 24 = ?



3 × 4 = 12



3 × 20 = 60

60 + 12 = 72

3 × 24 = 72

4 × 13 = ?

4 × 3 = 12 *4 × 10 = 40*

12 + 40 = 52

4 × 13 = 52

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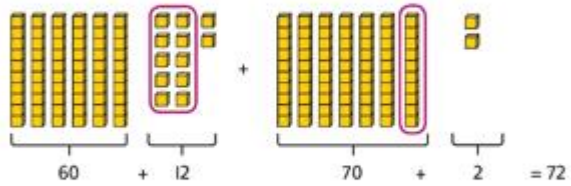
Multiplying a 2-digit number by a 1-digit number, expanded column method: Use place value equipment to model how 10 ones are exchanged for a 10 in some multiplications.

3 × 24 = ?

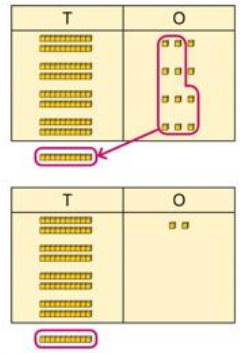
3 × 20 = 60
3 × 4 = 12



3 × 24 = 60 + 12
3 × 24 = 70 + 2
3 × 24 = 72

Demonstrate that an exchange of 1s for 10s and 10s for 100s may also be required.

4 × 23 = ?



4 × 23 = 92

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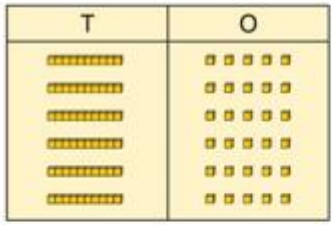
Children may write calculations in expanded column form, but must understand the link with place value and exchange and should write the expanded parts of the calculation separately.




```
  T  O
  1  5
×    6
-------
                6 × 5
+               6 × 10
-------
```

5 × 28 = ?

```
  T  O
  2  8
×    5
-------
  4  0      5 × 8
1  0  0      5 × 20
-------
1  4  0
-------
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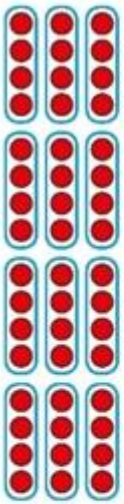
Year 3 Division

Using times-tables knowledge to divide

24 divided into groups of 8.
There are 3 groups of 8.



48 divided into groups of 4.
There are 12 groups.

4 × 12 = 48
48 ÷ 4 = 12

I need to work out 30 shared between 5.

I know that 6 × 5 = 30
so I know that 30 ÷ 5 = 6.

A bar model may represent the relationship between sharing and grouping.

24 ÷ 4 = 6
24 ÷ 6 = 4

Children understand how division is related to both repeated subtraction and repeated addition.

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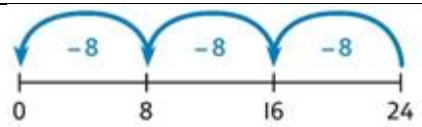
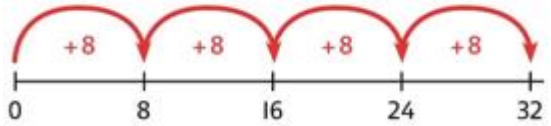


24 ÷ 8 = 3



32 ÷ 8 = 4

Understanding remainders: Use equipment to understand that a remainder occurs when a set of objects cannot be divided equally any further. To follow on, use images.

There are 13 sticks in total.
There are 3 groups of 4, with 1 remainder.

22 ÷ 5 = 4 remainder 2

22 ÷ 5 = ?

3 × 5 = 15
4 × 5 = 20
5 × 5 = 25 … this is larger than 22
So, 22 ÷ 5 = 4 remainder 2

Images taken from Power Maths and NCETM
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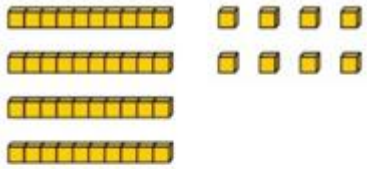
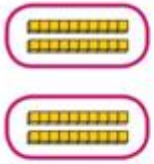
2-digit number divided by 1-digit number, no remainders: Use equipment to enable children to explore. Use partition models to support understanding.



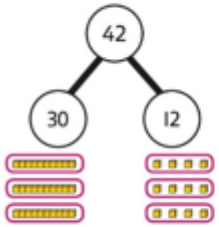
48 ÷ 2 = ?

First divide the 10s.



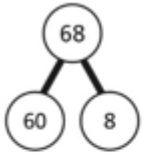
Then divide the 1s.

I need to partition 42 differently to divide by 3.



42 = 30 + 12

42 ÷ 3 = 14



60 ÷ 2 = 30
8 ÷ 2 = 4
30 + 4 = 34
68 ÷ 2 = 34
Children partition flexibly to divide where appropriate.

42 ÷ 3 = ?
42 = 40 + 2

I need to partition 42 differently to divide by 3.

42 = 30 + 12

30 ÷ 3 = 10
12 ÷ 3 = 4

10 + 4 = 14
42 ÷ 3 = 14

Images taken from Power Maths and NCETM
Policy created June 2021.

2-digit number divided by 1-digit number, with remainders: Use place value equipment to understand the concept of remainder. Use partitioning to divide and use contexts to support understanding.

Make 29 from place value equipment.
Share it into 2 equal groups.

67 children try to make 5 equal lines.

67 = 50 + 17
50 ÷ 5 = 10

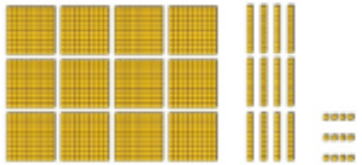
17 ÷ 5 = 3 remainder 2
67 ÷ 5 = 13 remainder 2

There are 13 children in each line and 2 children left out.

Year 4	
Year 4 Multiplication and Division Vocabulary	Equal, groups, array, row, column, double, twice, group, part-whole model, whole, part, number sentence, odd, even, count in twos, threes, fives, count in tens (forwards from/backwards from) How many times? Lots of, groups of, once, twice, three times, five times, repeated addition, share, share equally, double, halve, groups (pairs, threes, fives), divide, multiply, left, left over, partition, product, multiple, inverse
National curriculum Year 4 Multiplication and Division objectives	• Recall multiplication and division facts for multiplication tables up to 12 x 12 • Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers • Recognise and use factor pairs and commutativity in mental calculations • Multiply two-digit and three-digit numbers by a one-digit number using formal written layout • Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as *n* objects are connected to *m* objects

Year 4 Multiplication

Multiplying by multiples of 10 and 100: Use unitising and place value equipment to understand how to multiply by multiples of 1, 10 and 100 and progress onto using known facts and understanding of place value and commutativity to multiply mentally.



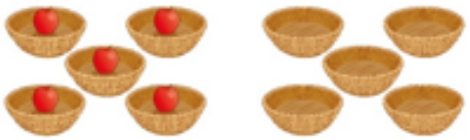
3 × 4 = 12
3 × 40 = 120
3 × 400 = 1,200

4 × 7 = 28

4 × 70 = 280
40 × 7 = 280

4 × 700 = 2,800
400 × 7 = 2,800

Understanding times-tables up to 12 × 12: Use concrete equipment/objects to understand what happens when multiplying by 1 and by 0. Use equipment to demonstrate the x11, x 12 times tables in relation to the x 10 times table. Make links with counting patterns and times tables in relation to each other.



5 × 1 = 5

5 × 0 = 0

Represent the ×11 table and ×12 tables in relation to the ×10 table.

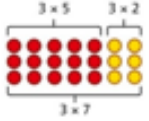
2 × 11 = 20 + 2
3 × 11 = 30 + 3
4 × 11 = 40 + 4

4 × 12 = 40 + 8

Understand links between the ×3 table, ×6 table and ×9 table
5 × 6 is double 5 × 3

×5 table and ×6 table
I know that 7 × 5 = 35
so I know that 7 × 6 = 35 + 7.

×5 table and ×7 table
3 × 7 = 3 × 5 + 3 × 2

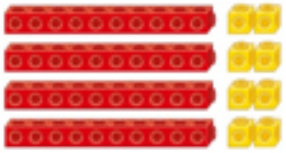


×9 table and ×10 table
6 × 10 = 60
6 × 9 = 60 – 6

Images taken from Power Maths and NCETM
Policy created June 2021.

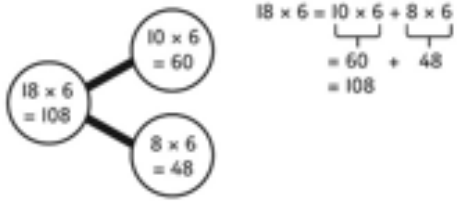
Understanding and using partitioning in multiplication: Make multiplications by partitioning.

4 × 12 is 4 groups of 10 and 4 groups of 2.



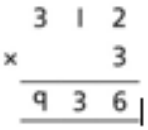
4 × 12 = 40 + 8

18 × 6 = ?



18 × 6 = 10 × 6 + 8 × 6
= 60 + 48
= 108

Column multiplication for 2- and 3-digit numbers multiplied by a single digit: Make multiplications using place value equipment and show alongside a column method. Understand how the expanded column method is linked to the formal column method.



Images taken from Power Maths and NCETM
Policy created June 2021.

Make 4 × 136 using equipment.

I can work out how many 1s, 10s and 100s.

There are 4 × 6 ones… 24 ones
There are 4 × 3 tens … 12 tens
There are 4 × 1 hundreds … 4 hundreds

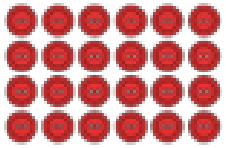
24 + 120 + 400 = 544

$$\begin{array}{r} 2\ 3 \\ \times\quad 5 \\ \hline 1\ 5 \\ 1\ 0\ 0 \\ \hline 1\ 1\ 5 \\ \hline \end{array}$$

$$\begin{array}{r} 2\ 3 \\ \times\quad 5 \\ \hline 1\ 1\ 5 \\ \hline 1 \end{array}$$

Year 4 Division

Understanding the relationship between multiplication and division, including times-tables: Use equipment to explore multiplication and division related facts.



4 × 6 = 24
24 is 6 groups of 4.
24 is 4 groups of 6.

24 divided by 6 is 4.
24 divided by 4 is 6.

I know that 5 × 7 = 35

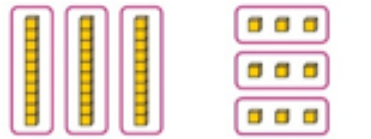
so I know all these facts:

5 × 7 = 35
7 × 5 = 35
35 = 5 × 7
35 = 7 × 5
35 ÷ 5 = 7
35 ÷ 7 = 5
7 = 35 ÷ 5
5 = 35 ÷ 7

Images taken from Power Maths and NCETM
Policy created June 2021.

Dividing 2-digit and 3-digit numbers by a single digit by partitioning into 100s, 10s and 1s: Use equipment to partition into 100s, 10s and 1s and divide where appropriate. Demonstrate using a part-whole model where appropriate.

39 ÷ 3 = ?



39 = 30 + 9

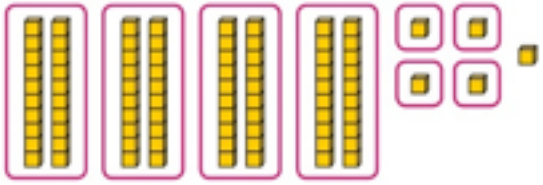
30 ÷ 3 = 10
9 ÷ 3 = 3
39 ÷ 3 = 13

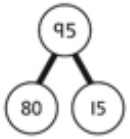
142 ÷ 2 = ?

100 ÷ 2 = 50
40 ÷ 2 = 20
6 ÷ 2 = 3
50 + 20 + 3 = 73
142 ÷ 2 = 73

Understanding remainders: Use place value equipment to find remainders. Represent the remainder as the part that cannot be shared equally. Use a part-whole model to show remainders in divisions.

85 shared into 4 equal groups.
There are 21 in each group and 1 that cannot be shared





80 ÷ 4 = 20
12 ÷ 4 = 3

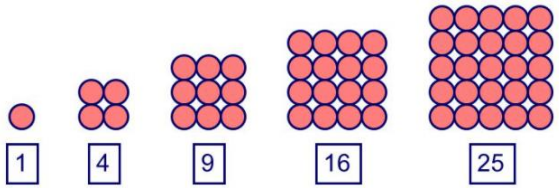
95 ÷ 4 = 23 remainder 3

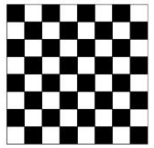
Images taken from Power Maths and NCETM
Policy created June 2021.

Year 5	
Year 5 Multiplication and Division Vocabulary	Equal, groups, array, row, column, double, twice, group, part-whole model, whole, part, number sentence, odd, even, count in twos, threes, fives, count in tens (forwards from/backwards from) How many times? Lots of, groups of, once, twice, three times, five times, repeated addition, share, share equally, double, halve, groups (pairs, threes, fives), divide, multiply, left, left over, partition, product, multiple, inverse, factor pairs, composite numbers, prime number, prime factors, square number, cubed number, formal written method
National curriculum Year 5 Multiplication and Division objectives	• Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • Establish whether a number up to 100 is prime and recall prime numbers up to 19 • Multiply and divide numbers mentally drawing upon known facts • Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) • Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes • Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates • Multiply and divide numbers mentally drawing upon known facts • Multiply numbers up to 4 digits by a one or two-digit number using a formal written method, including long multiplication for 2-digit numbers • Divide numbers up to 4 digits by a 1-digit number using the formal written method of short division and interpret remainders appropriately for the context • Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign

Year 5 Multiplication

Square numbers: Use cubes and counters to explore what square numbers are. *25 is a square number because it is made from 5 rows of 5*

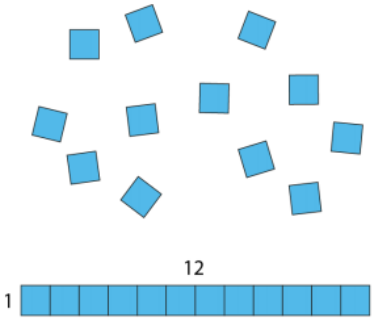




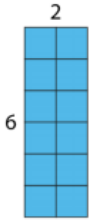
Use counters to explore square numbers and progress onto images. Finally, use a multiplication grid to circle each square number. What patterns can be found?

Factors: Arrange counters into arrays for pupils to explore factors. Progress onto using a multiplication chart and encourage them to use known multiplication facts to help find factors. *'__ is a factor of __ because __ is in the __ times table'.* Factor bugs can also be used.

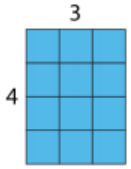
'How many different ways can you arrange "12" tiles into a rectangle?'



- *'There are "12" tiles. There is "1" row and "12" columns. So "12" and "1" are factors of "12".'*



'There are "12" tiles. There are "6" rows and "2" columns. So "6" and "2" are factors of "12".'

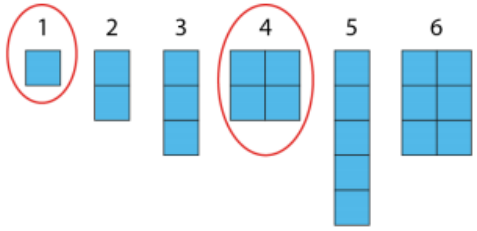


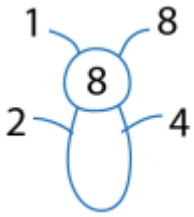
'There are "12" tiles. There are "4" rows and "3" columns. So "4" and "3" are factors of "12".'

Link to square numbers:

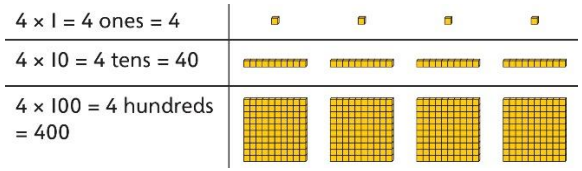
Images taken from Power Maths and NCETM
Policy created June 2021.

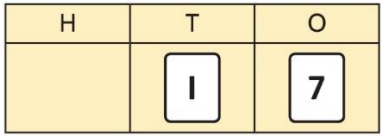
'Which of these are square numbers?'





Multiplying by 10, 100 and 1000: It is very important that children are not taught to 'just add a zero' otherwise they will not understand the place value effect of multiplying and dividing by 10, 100 and 1000.
Use dienes and base 10 physically move the equipment so that children can see what is happening

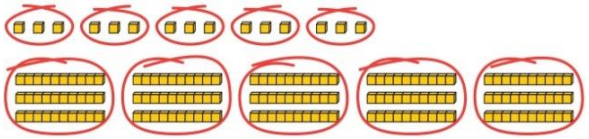




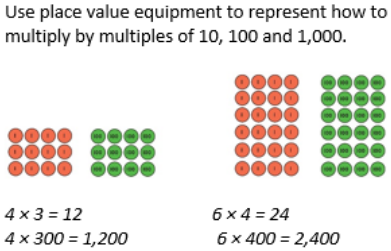
17 × 10 = 170
17 × 100 = 17 × 10 × 10 = 1,700
17 × 1,000 = 17 × 10 × 10 × 10 = 17,000

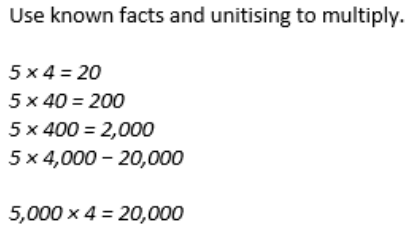
Images taken from Power Maths and NCETM
Policy created June 2021.

Multiplying by multiples of 10, 100 and 1000: Use place value equipment to explore multiplying by unitising. Use place value equipment to represent how to multiply by multiples of 10, 100 and 1,000. Use known facts and unitising to multiply.



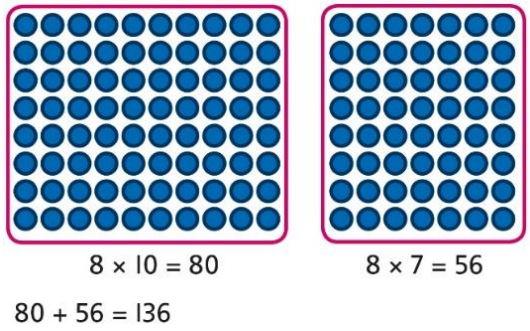
5 groups of 3 ones is 15 ones.
5 groups of 3 tens is 15 tens.

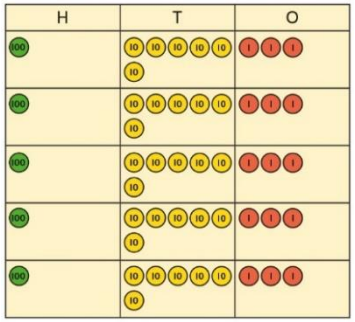




So, I know that 5 groups of 3 thousands would be 15 thousands.

Multiplying up to 4-digit numbers by a single digit: You can begin by using partitioning to multiply efficiently and place value equipment. Column multiplication including any required exchanges can then be used.





Multiplying 2-digit numbers by 2-digit numbers: Partition one number into 10s and 1s and then add the parts. Progress onto using an area (grid) model and finally use column multiplication.

Images taken from Power Maths and NCETM
Policy created June 2021.

23 × 15 = ?

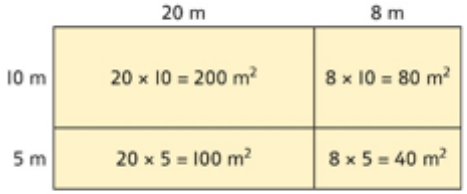
3 × 15 = 45

There are 345 bottles of milk in total.

H	T	O
1	5	0
1	5	0
+	4	5
3	4	5
	1	

23 × 15 = 345

28 × 15 = ?



H	T	O
2	0	0
1	0	0
	8	0
+	4	0
4	2	0
	1	

28 × 15 = 420

	3	4	
×	2	7	
2	3_2	8	34 × 7
	3	4	
×	2	7	
2	3_2	8	34 × 7
6	8	0	34 × 20
	3	4	
×	2	7	
2	3_2	8	34 × 7
6	8	0	34 × 20
9	1	8	34 × 27
	1		

Multiplying up to 4-digits by 2-digits: Use the area model and column multiplication as above.

Images taken from Power Maths and NCETM
Policy created June 2021.

Year 5 Division

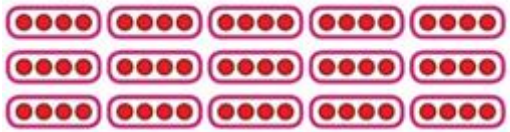
Understanding inverse operations and the link with multiplication, grouping and sharing: Use equipment to group and share and to explore the calculations that are present. Represent multiplicative relationships and explore the families of division facts. Represent the different multiplicative relationships to solve problems requiring inverse operations.

I have 28 counters.

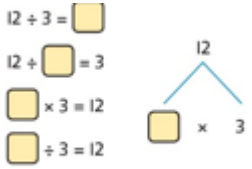
I made 7 groups of 4. There are 28 in total.

I have 28 in total. I shared them equally into 7 groups. There are 4 in each group.

I have 28 in total. I made groups of 4. There are 7 equal groups.



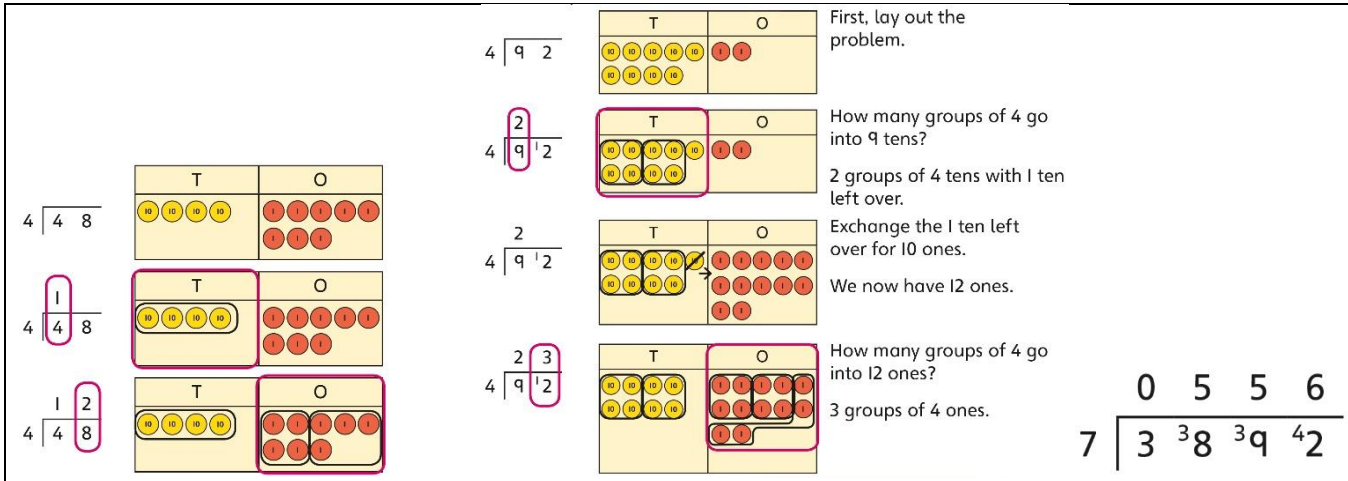
60 ÷ 4 = 15
60 ÷ 15 = 4



Understand missing number problems for division calculations and know how to solve them using inverse operations.
22 ÷ ? = 2
22 ÷ 2 = ?

Dividing up to four digits by a single digit using short division: Use place value equipment on a place value grid alongside short division.
The model uses grouping.

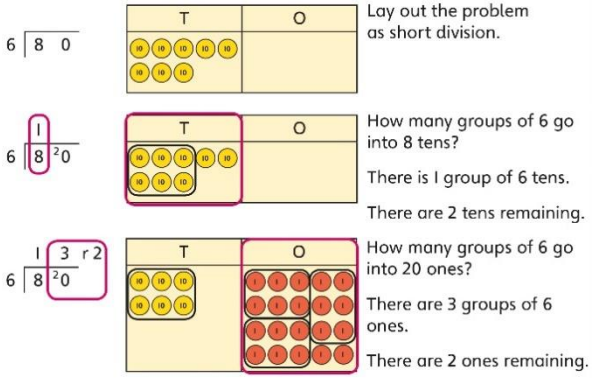
Images taken from Power Maths and NCETM
Policy created June 2021.



Understanding remainders:

80 cakes divided into trays of 6.

80 cakes in total. They make 13 groups of 6, with 2 remaining.



Images taken from Power Maths and NCETM
Policy created June 2021.

Understanding the relationship between fractions and division: Use sharing to explore the link between fractions and division. Use a bar model to show the link.

$1 \div 3 = \frac{1}{3}$

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

1 whole shared between 3 people.
Each person receives one-third.

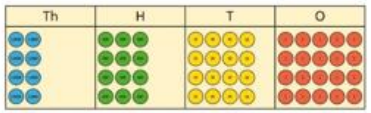
Year 6	
Year 6 Multiplication and Division Vocabulary	Equal, groups, array, row, column, double, twice, group, part-whole model, whole, part, number sentence, odd, even, count in twos, threes, fives, count in tens (forwards from/backwards from) How many times? Lots of, groups of, once, twice, three times, five times, repeated addition, share, share equally, double, halve, groups (pairs, threes, fives), divide, multiply, left, left over, partition, product, multiple, inverse, factor pairs, composite numbers, prime number, prime factors, square number, cubed number, formal written method, order of operations, common factors, common multiples
National curriculum Year 6 Multiplication and Division objectives	• Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions or by rounding as appropriate to the context • Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Perform mental calculations, including with mixed operations and large numbers • Identify common factors, common multiples and prime numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations

Images taken from Power Maths and NCETM
Policy created June 2021.

	• Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Solve problems involving addition, subtraction, multiplication and division

Year 6 Multiplication

Multiplying up to a 4-digit number by a single digit number: Use equipment to explore multiplications and compare methods.

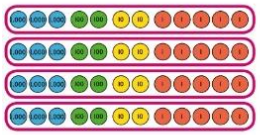


4 groups of 2,345

This is a multiplication:

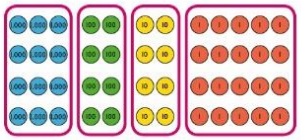
4 × 2,345
2,345 × 4

Method 1



```
  3 2 2 5
  3 2 2 5
  3 2 2 5
+ 3 2 2 5
-------
  1 2 9 0 0
    1   1 2
```

Method 2



4 × 3,000 4 × 200 4 × 20 4 × 5
12,000 + 800 + 80 + 20 = 12,900

Method 3

	3,000	200	20	5
4	12,000	800	80	20

12,000 + 800 + 80 + 20 = 12,900

Method 4

```
    3 2 2 5
×       4
-------
  1 2 9 0 0
      1 2
```

Multiplying up to a 4-digit number by a 2-digit number: Use an area model alongside written multiplication. Use compact column multiplication with understanding of place value at all stages.

Method 1

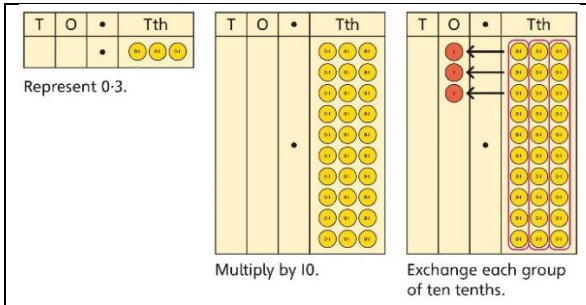
	1,000	200	30	5
20	20,000	4,000	600	100
1	1,000	200	30	5

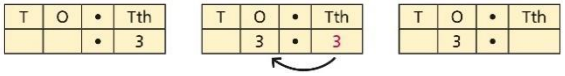
```
    1 2 3 5
×       2 1
-------
        5     1 × 5
      3 0     1 × 30
    2 0 0     1 × 200
  1 0 0 0     1 × 1,000
    1 0 0     20 × 5
    6 0 0     20 × 30
  4 0 0 0     20 × 200
2 0 0 0 0     20 × 1,000
-------
2 5 9 3 5     21 × 1,235
```

```
    1 2 3 5
×       2 1
-------
    1 2 3 5   1 × 1,235
2 4 7 0 0     20 × 1,235
-------
2 5 9 3 5     21 × 1,235
```

Multiplying by 10, 100 and 1,000: Use place value equipment to explore exchange in decimal multiplication. Show on a place value grid too.

Images taken from Power Maths and NCETM
Policy created June 2021.





0·3 × 10 = 3

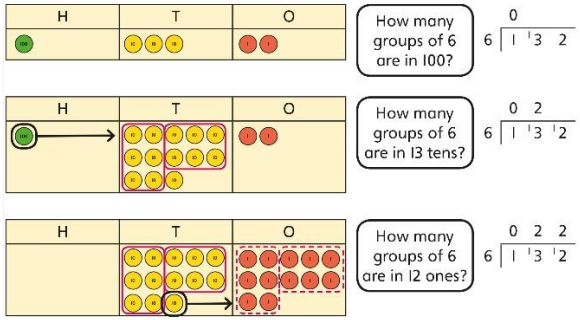
8 × 100 = 800
8 × 300 = 800 × 3
= 2,400

2·5 × 10 = 25
2·5 × 20 = 2·5 × 10 × 2
= 50

0·3 × 10 = ?
0·3 is 3 tenths.
10 × 3 tenths are 30 tenths.
30 tenths are equivalent to 3 ones.

Year 6 Division

Dividing by a single digit



$$6\overline{)1\,3\,2} \quad 0$$

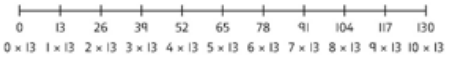
$$6\overline{)1\,3\,2} \quad 0\;2$$

$$6\overline{)1\,3\,2} \quad 0\;2\;2$$

Images taken from Power Maths and NCETM
Policy created June 2021.

Dividing by a 2-digit number using long division: Use long division where factors are not useful (for example, when dividing by a 2-digit prime number).
Write the required multiples to support the division process.

377 ÷ 13 = ?




```
13 | 3 7 7
-  1 3 0   10
   2 4 7
-  1 3 0   10
   1 1 7
-  1 1 7    9
     0     29
```

377 ÷ 13 = 29

A slightly different layout may be used, with the division completed above rather than at the side.

Images taken from Power Maths and NCETM
Policy created June 2021.