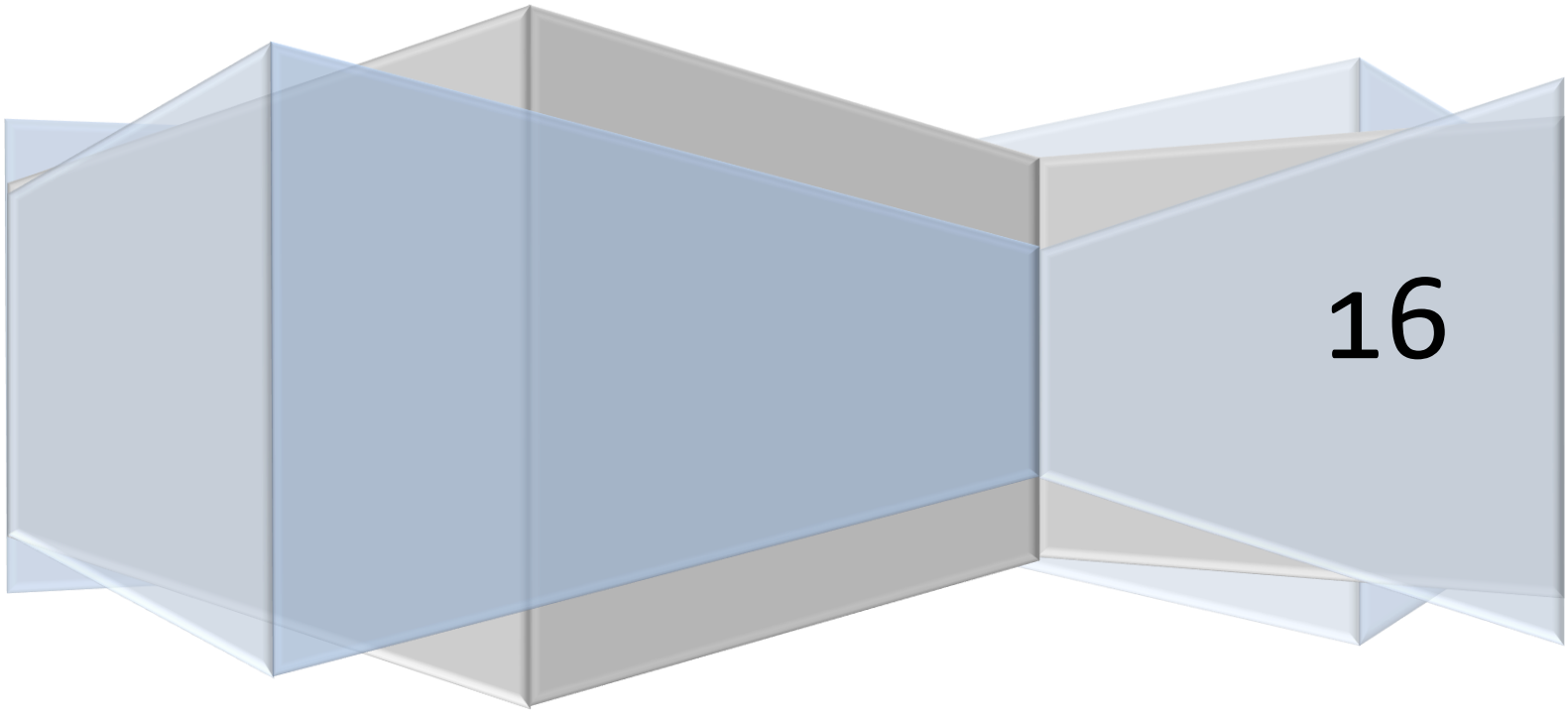
Whimple Primary School

Maths Calculation Policy

Division

Carole Shilston



Stages in Division

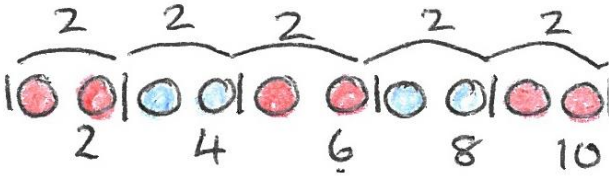
Early Stages (EYFS)

Children will engage in a variety of counting songs and rhymes and practical activities. Children will understand equal groups and share items out in play and problem solving. They will count back in 2s and 10s.

Counting in steps ('Clever' counting)

Count back in 2s from 10 and 10s from 100.

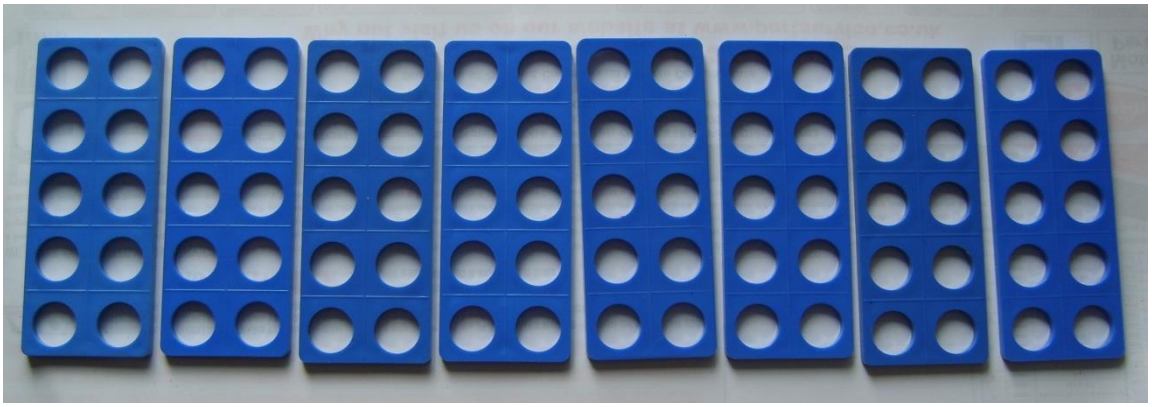
- **Using objects or pictures:**



10, 8, 6, 4, 2.

100, 90, 80, 70, 60, 50, 40, 30, 20, 10.

- **Using images of number: for example Numicon**



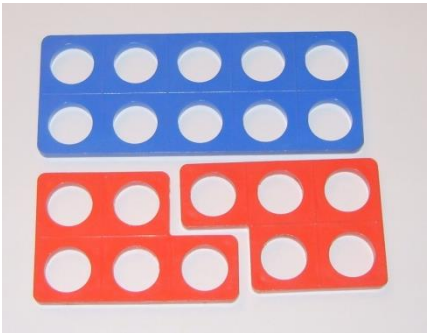
100, 90, 80, 70, 60, 50, 40, 30, 20, 10.

Stages in Division

Doubling and Halving

Find half of even numbers up to 10 including realising that it is hard to halve an odd number.

- **Using images of number: for example Numicon**



Half of 10 is 5.

- **Using objects:**

Half of 8 is 4.

Grouping and Sharing

Introduce children to the concept.
Is it fair?
Begin to use visual and concrete arrays and 'sets of' objects to find the answers to 'how many towers of 2 can I make with 6 cubes?'

I can make 3 towers of 2 cubes each with 6 cubes.

Stages in Division

Sharing

Begin to find half of a quantity using sharing, e.g. half of 10 dinosaurs by giving one each repeatedly to two children.

If I share 10 dinosaurs with my friend we have 5 dinosaurs each.

Key vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array

Early Years Foundation Stage – Early Learning Goal:

- Solve problems, including doubling, halving and sharing.

Key skills for division at Reception:

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations arrays with the support of the teacher
- Through grouping and sharing small quantities, pupils begin to understand, division, and finding simple fractions of objects, numbers and quantities.

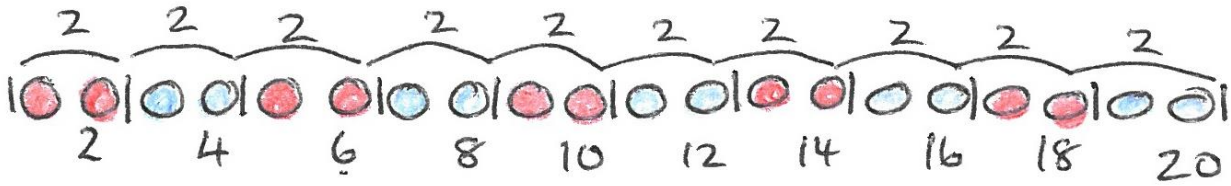
Stages in Division

Year 1

Children continue to engage in a variety of counting songs, rhymes and practical activities. Children will group and share items out in play and problem solving. They will count back in 2s, 5s and 10s and find half of even numbers by sharing. Children will start to use visual and concrete arrays or 'sets of' to find how many sets of a small number make a larger number.

Counting in steps ('Clever' counting)

Count back in steps of 2s from 20 and 10s from 100 and beyond.



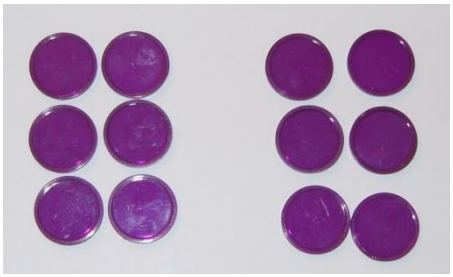
Looking at repeated subtraction:

20 – 2 = 18	10 – 2 = 8
18 – 2 = 16	8 – 2 = 6
16 – 2 = 14	6 – 2 = 4
14 – 2 = 12	4 – 2 = 2
12 – 2 = 10	2 – 2 = 0

Doubling and Halving

Find half of even numbers up to 12 including realising that it is hard to halve an odd number.

- **Using objects:**



Half of 12 is 6.

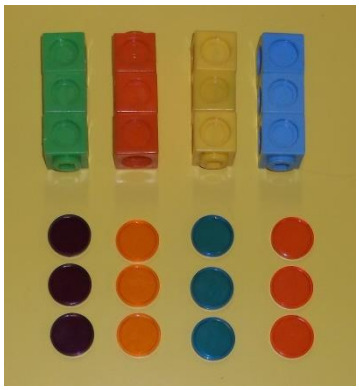
Stages in Division

❖ **Using images of number: for example Cuisinaire**

Half of 10 is 5.

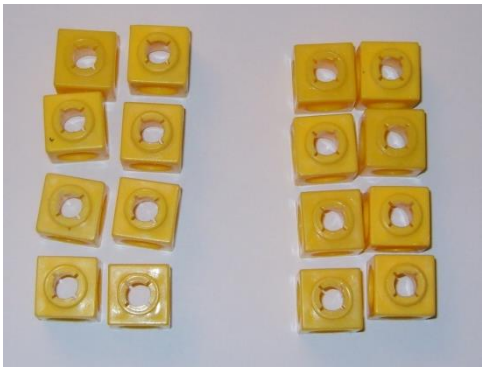
Grouping

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to 'how many towers of 3 can I make with 12 cubes?'



Sharing

Begin to find half of a quantity using sharing, e.g. half of 16 cubes by giving one each repeatedly to two children.



Key vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array

National Curriculum 2014 statements:

- 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.

Key skills for division at Year 1:

- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations arrays with the support of the teacher
- Through grouping and sharing small quantities, pupils begin to understand, division, and finding simple fractions of objects, numbers and quantities.
- They make connections between arrays, number patterns, and counting in twos, fives and tens.

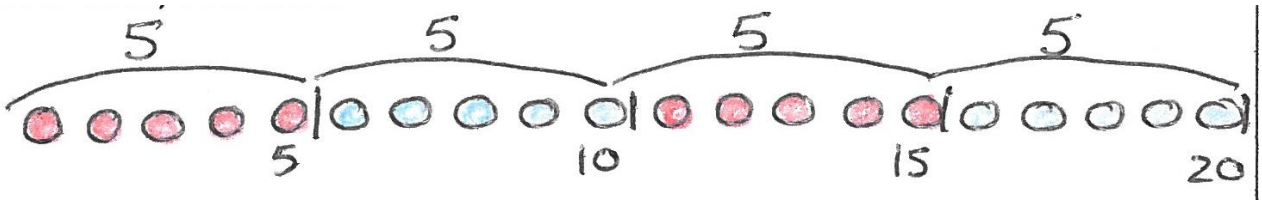
Stages in Division

Year 2

Children will develop their understanding of division and use jottings to support calculation. They will count back in 2s, 5s and 10s and begin to count back in 3s and find half of even numbers to 20. Children will start to relate division to grouping. They will find a ½, 1/3, ¼ and ¾ of a quantity of objects and of amounts.

Counting in steps ('Clever' counting)

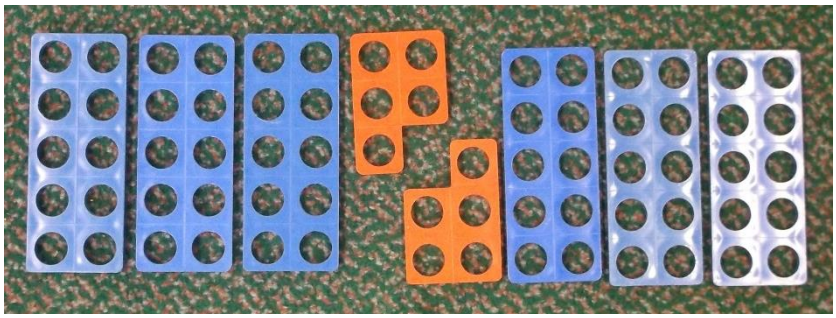
Count in steps of 2s, 5s and 10s.



Doubling and Halving

- **Find half of numbers up to 40, including realising that half of an odd number gives a remainder of 1 or an answer containing a ½.**

- **Begin to know half of multiples of 10 to 100.**
  e.g. half of 70 is 35.
  - **Using images of number: for example Numicon**



Using Number Facts

- **Know halves of even numbers to 24.**

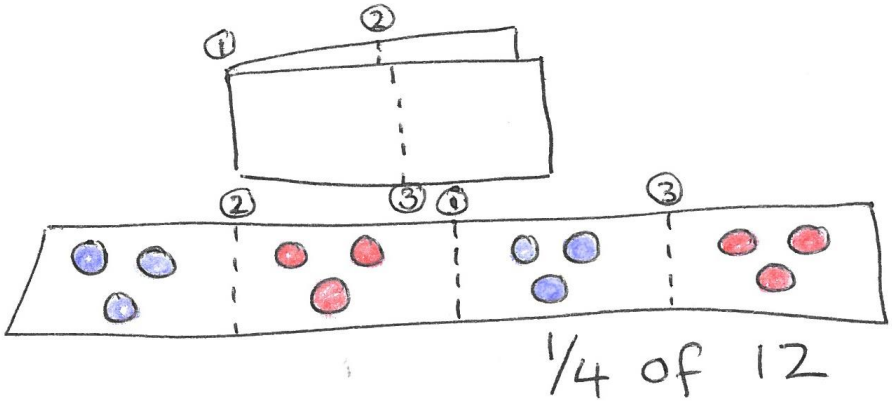
- **Know 2x, 5x, and 10x division facts.**

- **Begin to know 3x division facts.**

Stages in Division

Sharing

- **Begin to find half or a quarter of a quantity using sharing.**
  e.g. $\frac{1}{4}$ of 12 cubes by sorting the cubes into four piles.

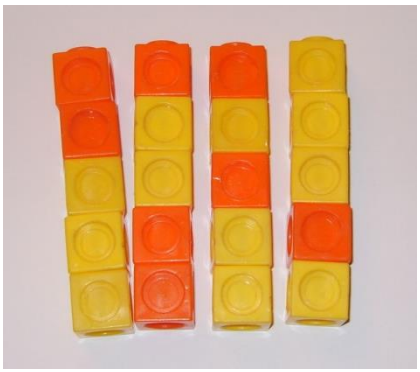


- **Find $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$ of small quantities.**

Grouping

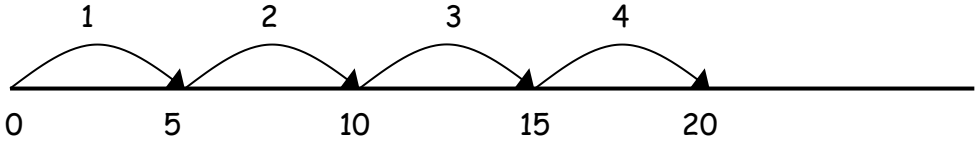
- **Relate division to multiplication by using arrays or towers of cubes to find answers to division.**
  e.g. how many towers of five cubes can I make from 20 cubes as
  5 x ☐ = 20 and also 20 ÷ 5 = ?

Using objects:



Counting in steps using a number line:

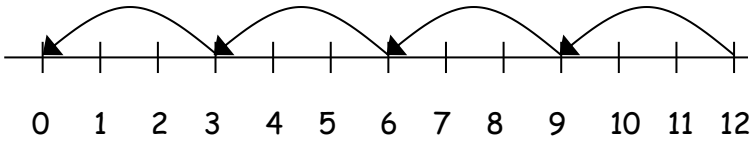
Relate division to 'clever' counting and hence to multiplication, e.g. how many 5's do I count to get to 20?

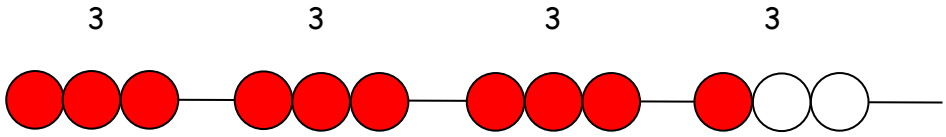


Stages in Division

Repeated subtraction using a number line or bead bar

12 ÷ 3 = 4





The bead bar will help children with interpreting division calculations such as 10 ÷ 5 as 'how many 5s make 10?'

Using symbols to stand for unknown numbers to complete equations using inverse operations

□ ÷ 2 = 4 20 ÷ △ = 4 □ ÷ △ = 4

Key vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over

National Curriculum 2014 statements:

- 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 (×), division (÷) and equals (=) signs.
- 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.

Key skills for division at Year 2:

- Count in steps of 2, 3, and 5 from 0
- 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 x, ÷ and = signs.
- 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.

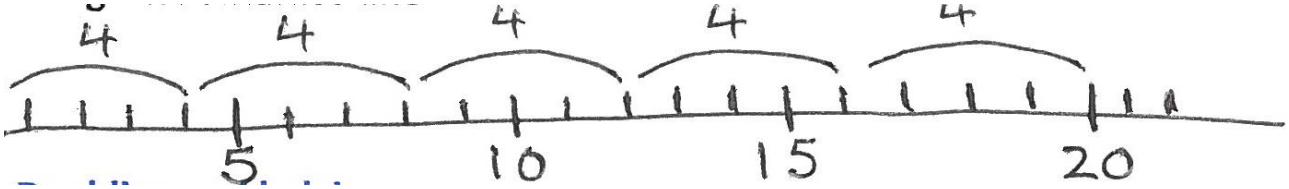
Stages in Division

Year 3

Children will continue to develop their understanding of division with the emphasis on grouping rather than sharing. They will count back in 2s, 3s, 4s, 5s, 8s and 10s and divide whole numbers by 10 or 100 to give whole number answers. Children will recognise that division is not commutative. They will divide larger numbers mentally by subtracting the tenth multiple.

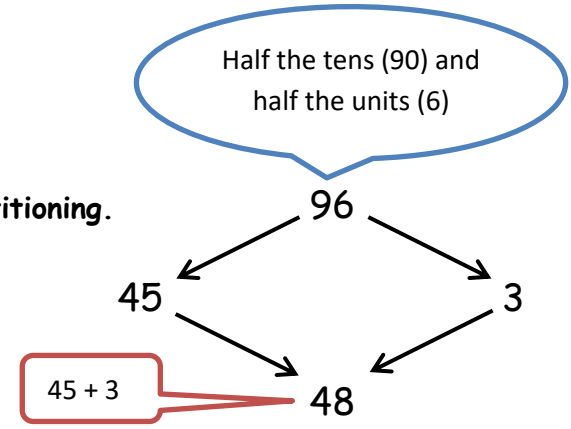
Counting in steps ('Clever' counting)

- **Count in 2s, 3s, 4s, 5s, 8s and 10s by colouring numbers on the 1-100 grid or using a landmarked line.**



Doubling and Halving

- **Find halve of even numbers to 100 using partitioning.**



- **Use halving as a strategy in dividing by 2.**
  e.g. 36 ÷ 2 is half of 36

Using Number Facts

- **Know halves of even numbers to 40.**
  Know halves of multiples of 10 to 200, e.g. half of 170 is 85.

- **Know 2x, 3x, 4x, 5x, 8x, 10x division facts.**
  e.g. if I know 4 x 6 = 24 I also know 24 ÷ 4 = 6

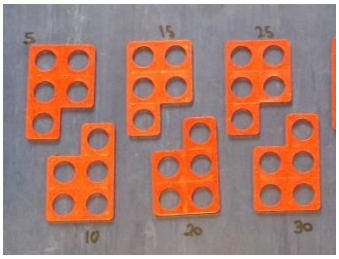
- **Use division facts to find unit and simple non-unit fractions of amounts within the times tables**
  e.g. $\frac{3}{4}$ of 48 is 3 x (48 ÷ 4); or knowing $\frac{1}{4}$ of 48 is 12 so $\frac{3}{4}$ is 12 + 12 + 12 = 36

Stages in Division

Grouping

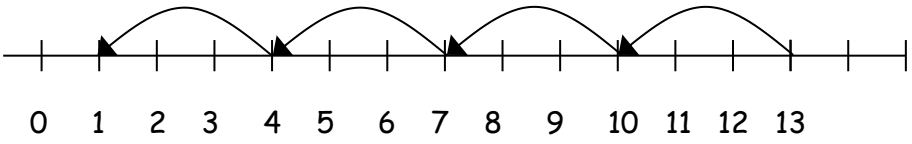
- **Recognise that division is not commutative**
  e.g. 16 ÷ 8 does not equal 8 ÷ 16.

- **Relate division to multiplication 'with holes in';**
  e.g. ☐ x 5 = 30 is the same calculation as 30 ÷ 5 = ?
  thus we can count in 5's to find the answer.
  (5, 10, 15, 20, 25, 30, so the answer is 6).



- **Divide multiples of 10 by single digit numbers**
  e.g. 240 ÷ 8 = 30
  By knowing that 24 ÷ 8 = 3
  and 240 is ten times more than 24 so the answer is also ten times more (30).

- **Divide with remainders**
  e.g 13 ÷ 3 = 4 r1



Children continue to work out unknown division facts by grouping on a number line from zero. They are also now taught the concept of **remainders**, as in the example. This should be introduced practically and with arrays, as well as being translated to a number line.

Children should work towards calculating some basic division facts with remainders mentally for the 2s, 3s, 4s, 5s, 8s and 10s, ready for "carrying" remainders across within the short division method.

Stages in Division

Key vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple

National Curriculum 2014 statements:

- 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.

Key skills for division at Year 3:

- Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables (through doubling, connect the 2, 4 and 8s).
- 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 for-mal written methods.
- Solve problems, in contexts, and including missing number problems, involving multiplication and division.
- Pupils develop efficient mental methods, for example, using multiplication and division facts (e.g. using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (30 × 2 = 60, so 60 ÷ 3 = 20 and 20 = 60 ÷ 3).
- Pupils develop reliable written methods for division, starting with calculations of 2-digit numbers by 1-digit numbers.

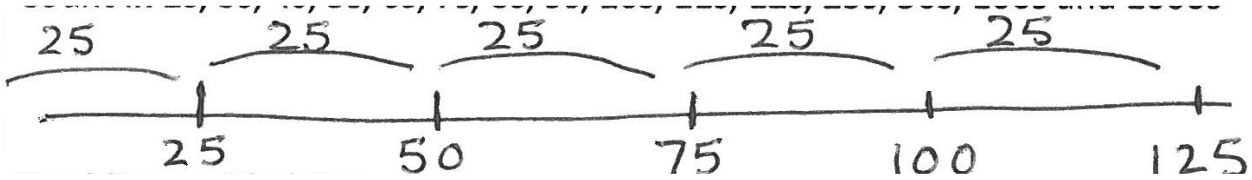
Stages in Division

Year 4

Children will learn by heart most of the division facts up to 144 ÷ 12 and they will be able to use these facts to solve a range of maths calculations; for example, knowing 32 ÷ 8 = 4 and applying this and their place value knowledge to calculate 3200 ÷ 4. They will use their place value and number facts in a wider range of mental division calculations. Children will continue to half larger even numbers and amounts of money. In year 4 children will be introduced to using a written method to divide a 2-digit or a 3-digit number by a single digit number and give whole number remainders.

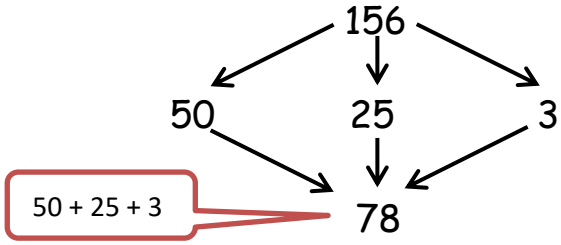
Counting in steps ('Clever' counting)

- **Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s.**



Doubling and Halving

- **Find halves of even numbers to 200 and beyond using partitioning.**



- **Use halving as a strategy in dividing by 2.**

  Begin to half amounts of money, e.g. £9 halved is £4.50

  Use halving as a strategy in dividing by 2, 4 and 8,
  e.g. 164 ÷4 is half of 164 (82) halved again (41).

Using Number Facts

- **Know times tables up to 12 x 12 and all related division facts.**

63 ÷ 7 = 9 also written as 9 = 63 ÷ 7
63 ÷ 9 = 7 also written as 7 = 63 ÷ 9
7 x 9 = 63 also written as 63 = 7 x 9
9 x 7 = 63 also written as 63 = 9 x 7

Using these facts to know that: $1/7^{th}$ of 63 is 9 and
$1/9^{th}$ of 63 is 7

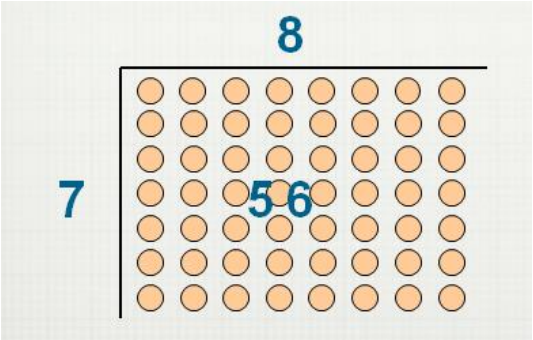
Stages in Division

- **Use division facts to find unit and non-unit fractions of amounts within the times tables**, *e.g.* 7/8 of 56 is 7 x (56 ÷ 8)

Grouping

- **Arrays**

Use arrays as an image for division as well as multiplication.
e.g. 56 ÷ 7 = 8



- **Use multiples of 10 times the divisor to divide by number ≤ 9 above the tables facts**

e.g. 45 ÷ 3
3 x 10 = 30
45 – 30 = 15
15 ÷ 3 =5
So 45 ÷ 3 = 10 + 5 = 15

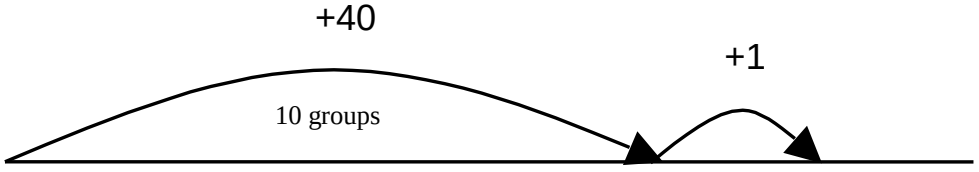
Knowing 10 lots of 3 is 30 and subtracting that from 45 leaves 15. Then calculating how many 3s are in 15 (5); 10 + 5 = 15, so there are fifteen threes in 45.

- **Divide multiples of 100 by single digit numbers using division facts**

e.g. 3200 ÷ 8 = 400
using place value knowledge 32 ÷ 8 = 4,
320 ÷ 8 = 40
therefore 3200 ÷ 8 = 400

- **Divide with remainders**

e.g. 41 ÷ 4 = 10 r1



41 = (10 x 4) + 1

Stages in Division

Written division

- **Chunking is a written version of a mental method for 2-digit ÷ 1 digit numbers.**

72 ÷ 5 lies between 50 ÷ 5 = 10 and 100 ÷ 5 = 20

* Partition the dividend into multiples of the divisor:

e.g 72 = 50 + 22

50 ÷ 5 = 10

22 ÷ 5 = 4r2 → 10 + 4r2 = 14 r 2

OR

72
- 50 (10 groups)
22
- 20 (4 groups)
2

Answer: 14 remainder 2

Another written version of a mental method:

e.g. 86 ÷ 3 =

□ x 3 = 86

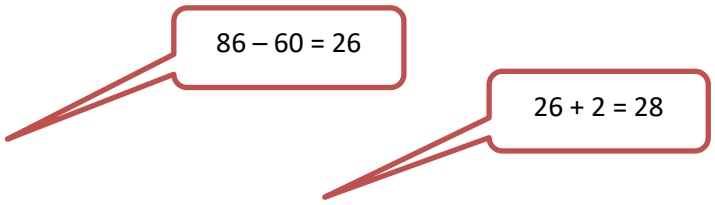
20 x 3 = 60

26

8 x 3 = 24

2

therefore 84 ÷ 3 = 28 r2



Key vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor

National Curriculum 2014 statements:

- Recall multiplication and division facts for multiplication tables up to 12 × 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.

Key skills for division at Year 4:

- **Recall multiplication and division facts for all numbers up to 12 x 12.**
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying and dividing by 10 and 100 and 1.
- Pupils practise to become fluent in the formal written method of short division with exact answers when dividing by a one-digit number
- Pupils practise mental methods and extend this to three-digit numbers to derive facts, for example 200 × 3 = 600 so 600 ÷ 3 = 200
- Pupils solve two-step problems in contexts, choosing the appropriate operation, working with increasingly harder numbers. This should include correspondence questions such as three cakes shared equally between 10 children.

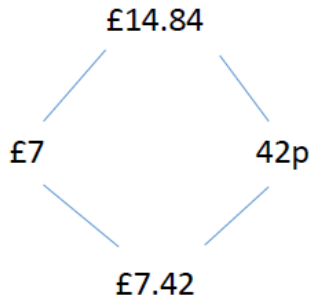
Stages in Division

Year 5

Children will learn by heart all the division facts up to 144 ÷ 12 and they will be able to use these facts to solve a range of maths calculations; for example, knowing 63 ÷ 9 = 7 and applying this and their place value knowledge to calculate 6300 ÷ 9. They will divide whole numbers by 10, 100, 1000 and 10,000 to give whole number answers or answers with 1, 2 or 3 decimal places. Children will continue to use doubling and halving as mental division strategies, for example, 34 ÷ 5 is the same as (34 ÷ 100) x 2. For recording and solving division calculations children will continue to use short division to divide a number with up to 4 digits by a number 12 or less.

Doubling and Halving

- **Halve amounts of money using partitioning**
  e.g. half of £14.84 as half of £14 and half of 84p, then added together (£7 + 42p = £7.42)



- **Use doubling and halving as a strategy in dividing 2, 4, 8, 5 and 20**
  e.g. 115 ÷ 5 as double 115 (230) ÷ 10 = 23.

Using Number Facts

- **Use division facts from the times tables up to 12 x 12 to divide multiples of powers of ten of the divisor**
  e.g. 3600 ÷ 9 using 36 ÷ 9 = 4
  so 360 ÷ 9 = 40
  therefore 3600 ÷ 9 = 400

- **Know square numbers and cube numbers.**
  e.g. $4^2 = 4 \times 4 = 16$
  $4^3 = 4 \times 4 \times 4 = 64$

Grouping

- **Divide numbers by 10, 100, 1000 to obtain decimal answers with up to three places**
  e.g. 340 ÷ 100 = 3.4

- **Use the 10th 20th 30th … multiple of the divisor to divide friendly 2-digit and 3-digit numbers by single-digit numbers**
  e.g. 186 ÷ 6 as 30 x 6 (180) and 1 x 6 (6).

Stages in Division

- **Find unit and non-unit fractions of large amounts**

e.g. 3/5 of 265 is 3 x (265 ÷ 5)

is 3 x (53)

3/5 of 265 = 159

Written division

- **Continuing with 'Chunking' as a written version of a mental strategy for 3-digit ÷ 1 digit numbers.**

e.g. 326 ÷ 6 =

☐ x 6 = 326

50 x 6 = 300 leaves 26

4 x 6 = 24 leaves 2

So 326 ÷ 6 = 54 r2

e.g. 256 ÷ 7 =

256 ÷ 7 lies between 210 ÷ 7 = 30 and 280 ÷ 7 = 40

Partition the dividend into multiples of the divisor:

256 = 210 + 46

210 ÷ 7 = 30

46 ÷ 7 = 6r4 → 30 + 6r4 = 36r4

OR

256

- 210 (30 groups)

46

- 42 (6 groups)

4

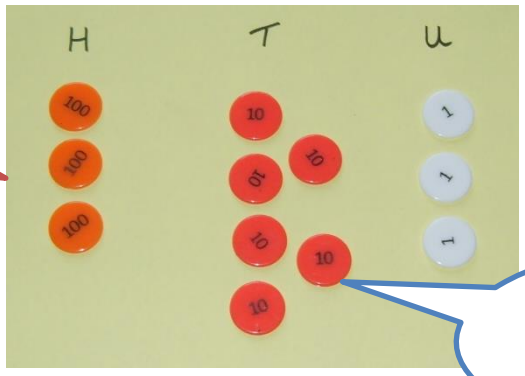
Answer: 36 remainder 4

Stages in Division

❖ **Using place value apparatus to group (leading to short division)**

e.g. 363 ÷ 3 =

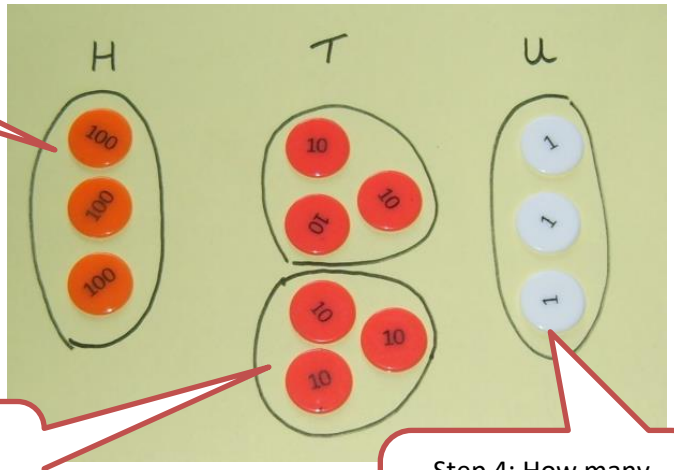
Step 1: Set up the place value counters to represent the number to be divided.



We are dividing by 3 so we need to group into 3s or multiples of 3.

Step 2: How many groups of 3 hundreds (300) can you make? **(1)**

1 2 1



Step 3: How many groups of 3 tens (30) can you make? **(2)**

Step 4: How many groups of 3 ones (3) can you make? **(1)**

So 363 ÷ 3 = 121

Written as a short division:

$$\begin{array}{r|l} & 121 \\ \hline 3 & 363 \end{array}$$

How many groups of 3 hundreds (300) can you make? **(1)**

How many groups of 3 tens (30) can you make? **(2)**

How many groups of 3 ones (3) can you make? **(1)**

Stages in Division

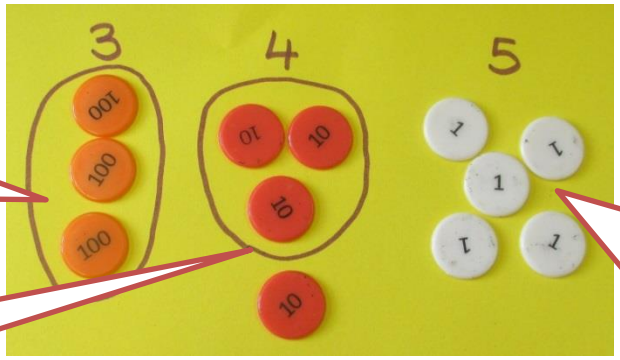
❖ **Using place value apparatus to group with exchanging (leading to short division)**

e.g. 345 ÷ 3

Step 1: Set up the place value counters to represent the number to be divided.

Step 2: How many groups of 3 hundreds (300) can you make? **(1)**

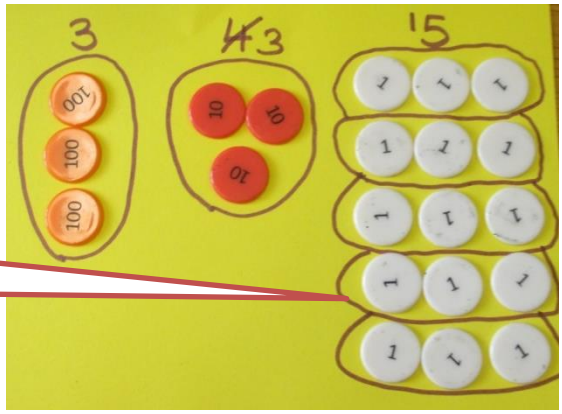
Step 3: How many groups of 3 tens (30) can you make? **(1)**



Step 4: The ten(s) left over have to be exchanged for ones. Each 1 ten is exchanged for 10 ones.

1 1 5

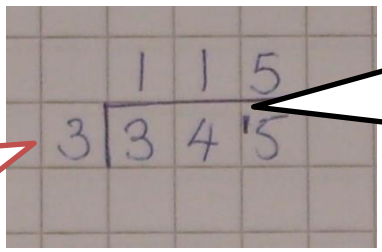
Step 5: How many groups of 3 ones (3) can you make? **(5)**



So 345 ÷ 3 = 115

Written as a short division:

How many groups of 3 hundreds (300) can you make? **(1)** How many groups of 3 tens (30) can you make? **(1)** The one ten is carried into the units column making 15. How many groups of 3 ones (3) can you make? **(5)**

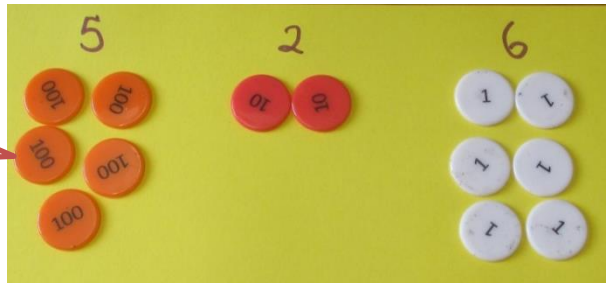


The carried ten is written smaller and in front of the 5 units to show there are temporarily 15 in the units column.

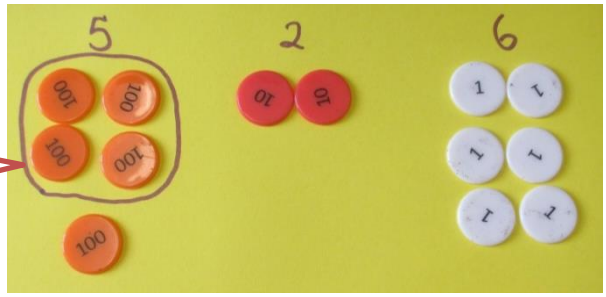
Stages in Division

- **Using place value apparatus to group with exchanging and remainders (leading to short division)**

e.g. 526 ÷ 4

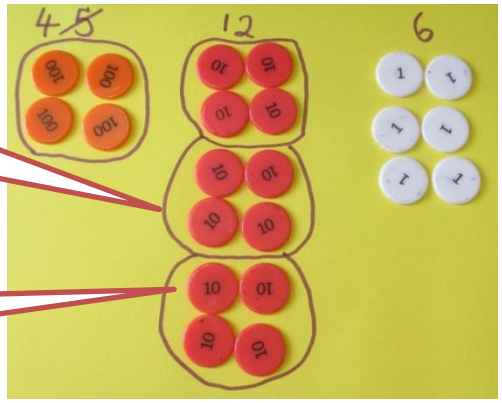


Step 1: Set up the place value counters to represent the number to be divided.

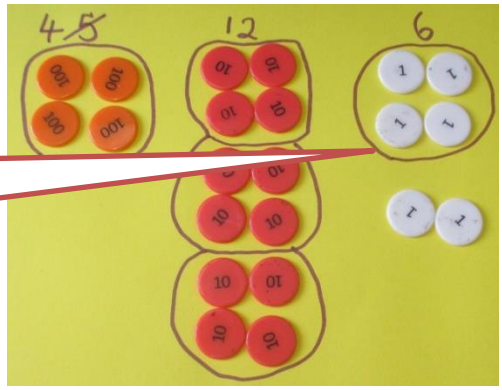


Step 2: How many groups of 4 hundreds (400) can you make? **(1)**

Step 3: The hundred(s) left over have to be exchanged for tens. Each 1 hundred is exchanged for 10 tens.



Step 4: How many groups of 4 tens (40) can you make? **(3)**

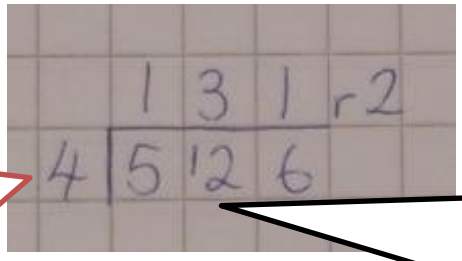


Step 5: How many groups of 4 ones (4) can you make? **(1)**How many are left over? **(2)**

So 526 ÷ 4 = 131 remainder 2

Written as a short division:

How many groups of 4 hundreds (400) can you make? **(1)** The one hundred is carried into the tens column making 12 tens. How many groups of 4 tens (40) can you make? **(3)** How many groups of 4 ones (4) can you make? **(1)** With 2 left over. (remainder)



The carried hundred is written smaller and in front of the 2 tens to show there are temporarily 12 tens in the tens column.

By Carole Shilston – Maths Subject Leader

Stages in Division

Key vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, multiple, divisible by, factor, quotient, prime number, prime factors, composite number (non-prime)

National Curriculum 2014 statements:

- Multiply and divide numbers mentally drawing upon known facts.
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.
- Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.
- Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Key skills for division at Year 5:

- Recall multiplication and division facts for all numbers up to 12 x 12 (as in Y4).
- Multiply and divide numbers mentally, drawing upon known facts.
- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two number.
- Solve problems involving multiplication and division where larger numbers are decomposed into their factors.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- Work out whether a number up to 100 is prime, and recall prime numbers to 19.
- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- Use multiplication and division as inverses.
- Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (e.g. 98 ÷ 4 = 24 r 2 = 241/2 = 24.5 ≈ 25).
- Solve problems involving combinations of all four operations, including understanding of the equals sign, and including division for scaling by different fractions and problems involving simple rates.

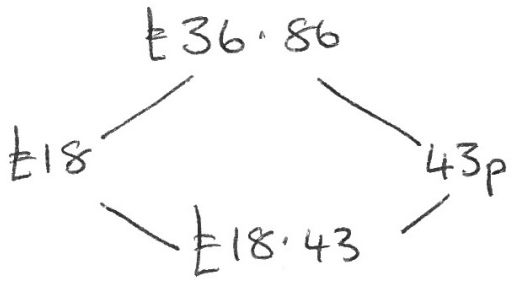
Stages in Division

Year 6

Children will know and use all the division facts up to 144 ÷ 12; they will be able to use these facts to solve a range of maths calculations in the most efficient way; for example, 196 ÷ 12 knowing 12 x 10 is 120 leaving 76 ÷ 12 = 6, so 196 ÷ 12 = 16 (10 + 6). They will identify common multiples and prime numbers to use in their mental division. Children will also use their knowledge of doubling and halving to divide by 2, 4, 8, 5, 20 and 25, for example, 628 ÷ 8 is halved 3 times: 314, 157, 78.5 Children will record their calculations using short division or long division, as and when appropriate.

Doubling and Halving

- **Halve decimal numbers with up to 2 places using partitioning**
  e.g. half of 36.86 is half of 36 (18) plus half of 0.86 (0.43), so is 18.43



- **Using doubling and halving as strategies in mental division.**
  e.g. 216 ÷ 4 is half of 216 (108) and half of 108 (54), so is 162.

Using Number Facts

- **Use division facts from the times tables up to 12 x 12 to divide decimal numbers by single-digit numbers.**
  e.g. 1.17 ÷ 3 is 1/100 of 117 ÷ 3
  117 ÷ 3 = 39
  39 ÷ 100 = 0.39

Grouping

- **Use 10th, 20th,30th, or 100th, 200th, 300th,… multiples of the divisor to divide large numbers.**
  e.g. 378 ÷ 9 as 40 x 9 = 360 and 2 x 9 = 18 so the answer is 42.

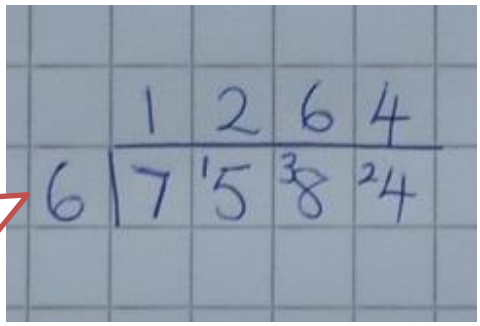
- **Use tests for divisibility.**
  e.g. 135 divides by 3 as 1 + 3 + 5 = 9 and 9 is in the 3x table.

Stages in Division

Written division

- **Short division of 3-digit and 4-digit numbers by single-digit numbers.**

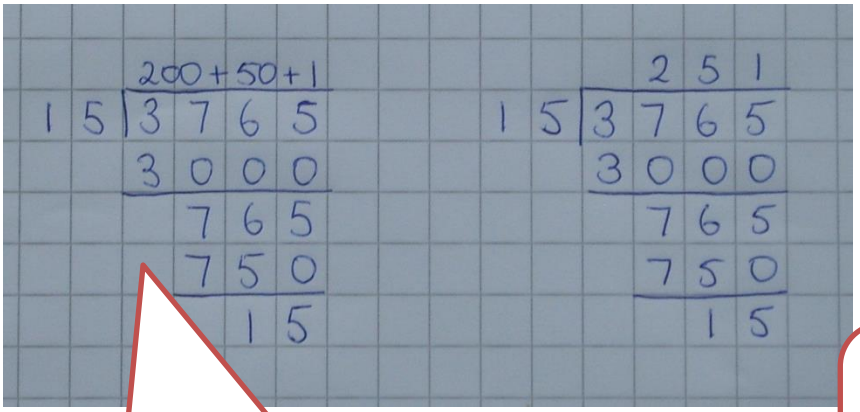
How many groups of 6 thousands (6000) can you make? **(1)** The one thousand is carried into the hundreds column making 15 hundred. (1500) How many groups of 6 hundreds (600) can you make? **(2)** The three hundreds are carried into the tens column making 38 tens. (380) How many groups of 6 tens (60) can you make? **(6)** The two tens are carried into the units column making 24. How many groups of 6 ones (6) can you make? **(4)**



- **Long division of 3-digit and 4-digit numbers by two-digit numbers.**

  e.g. Find out 'How many 15s are in 3765?' by subtracting 'chunks' of 15, until zero is reached (or until there is a remainder).

Introduce the method in a simple way by limiting the choice of chunks to
'Can we use 10 lots? Can we use 100 lots?'
As children become confident with the process encourage more efficient chunks to get the answer more quickly (e.g. 20x, 5x), and expand their 'useful' lists.



1	15	10	150
2	30	20	300
3	45		
4	60		
5	75		
6	90		

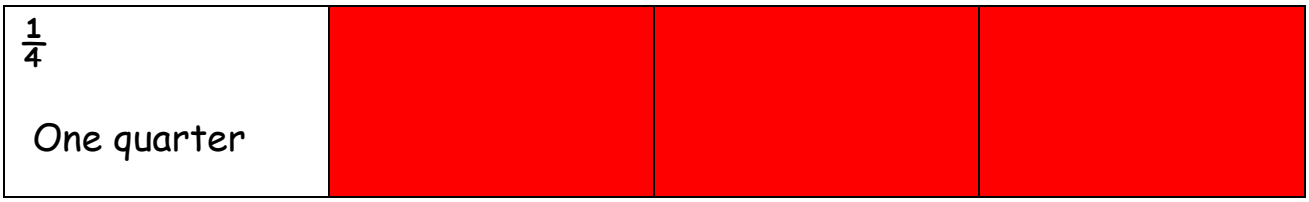
Each time an amount is subtracted from the total write how many lots above, e.g. knowing 15 x 2 = 30 and applying it to x 20 (300) and the x 200 (3000). Subtract from the start number to leave 765. From the useful list find how many lots to make next, i.e. 15 x 5 = 75 so 15 x 50 = 750. This leaves 15 left which is one lot.

Teach pupils to write a 'useful list' first at the side that will help them decide what chunks to use. Using 1x to get 10x or 100x or 2x to get 20x or 200x, etc.

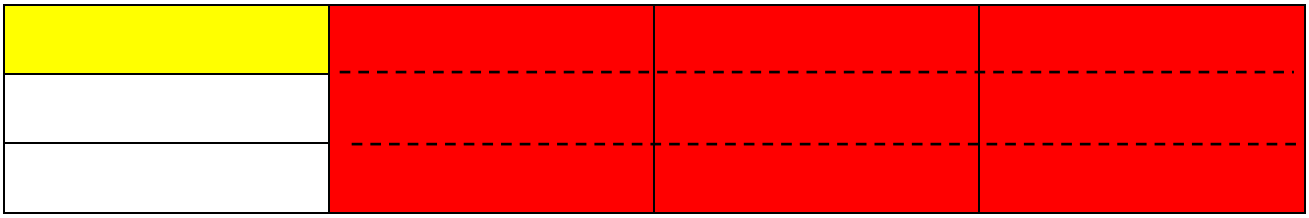
Stages in Division

- **Divide fractions by whole numbers.**
  e.g. $\frac{1}{4} \div 3 = 1/12$ (or say a quarter shared into 3 parts)

Draw 'a whole' to start and then find a quarter.



Find 'a third' of that quarter and extrapolate (extend) the lines to the three quarters not included in the calculation.



Using the extrapolation allows the total number of parts to be seen, allowing the yellow fraction to be calculated. (1/12)

Key vocabulary: share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over, inverse, short division, 'carry', remainder, factor, multiple, divisible by, quotient, prime number, prime factors, composite number (non-prime), common factor

National Curriculum 2014 statements:

- 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 for 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.
- Perform mental calculations, including with mixed operations and large numbers.
- Use their knowledge of the order of operations to carry out calculations involving the four operations.

Key skills for division at Year 6:

- Recall and use multiplication and division facts for all numbers to 12 x 12 for more complex calculations
- 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 for the context. Use short division where appropriate.
- Perform mental calculations, including with mixed operations and large numbers.
- Identify common factors, common multiples and prime numbers.
- Solve problems involving all 4 operations.
- Use estimation to check answers to calculations and determine accuracy, in the context of a problem.
- Use written division methods in cases where the answer has up to two decimal places.
- Solve problems which require answers to be rounded to specified degrees of accuracy.