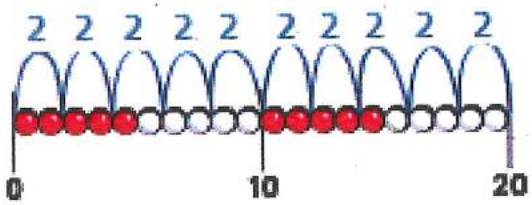
Barker's Lane Community School Calculation Policy

Year 1 Mental Division

1. Counting in steps:

Count in twos

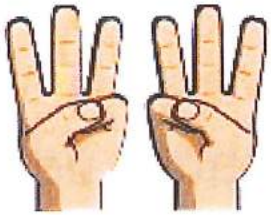


Count in tens

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

2. Doubling and halving:

Find half of even numbers up to 12, including realising that it is hard to solve an odd number. Knowing that halving is dividing by 2.



Year 1 Mental Division continued

3. Grouping:

Learners will undestand equal groups and share items out in play and problem solving.

Begin to use visual and concrete arrays and 'sets of' objects to find the answers to questions such as 'How many towers of three can I make with twelve cubes?'

4. Sharing:

Requires secure counting skills. Develops importance of one to one correspondence.

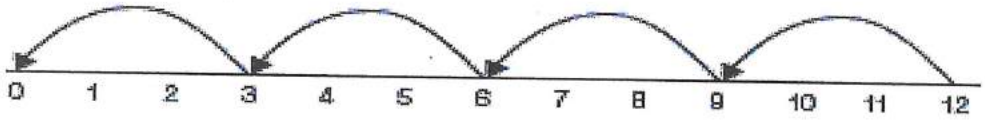
Begin to find half of a quantity using sharing

e.g. find half of 16 cubes by giving one each repeatedly to two children

Practical activities involving sharing, distributing cards when playing a game, putting objects onto plates, into cups, hoops etc.

Repeated subtraction using a number line or bead bar

$12 \div 3 = 4$

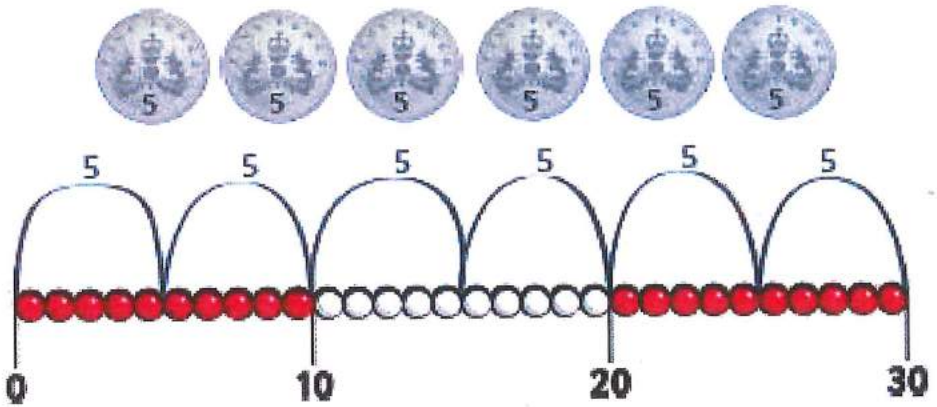


A bead bar will help learners with interpreting division calculations such as $10 \div 5$ as 'how many 5s make 10?'

Year 2 Mental Division

1. Counting in steps:

Count in 2s, 5s and 10s.

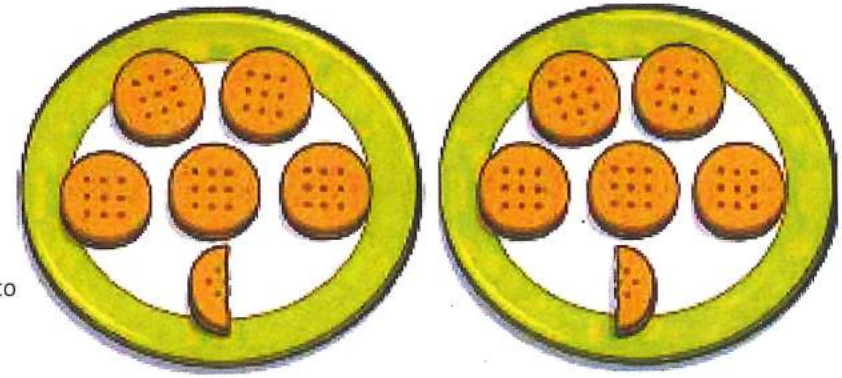


Begin to count in threes

2. 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 1/2

e.g. 1/2 of 11 = 5 1/2



Begin to know half of multiples of 10 to 100

e.g. half of 70 is 35

Year 2 Mental Division continued

3. 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 twenty cubes?' as ? x 5 = 20 and also as 20 ÷ 5 = ?

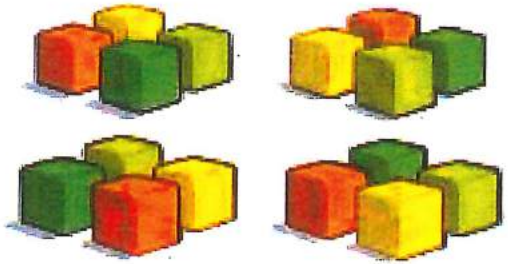
Relate division to counting and hence to multiplication

e.g. 'How many fives do I count to get twenty?'

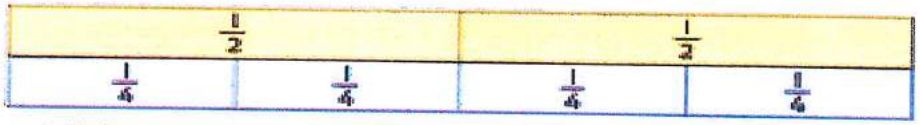
4. Sharing:

Begin to find half or a quarter of a quantity using sharing

e.g. find a quarter of 16 cubes by sorting the cubes into 4 piles



Find 1/4, 1/2, 3/4 of small quantities



Know half of even numbers to 24

Know x2, x5 and x10 division facts. Begin to know x3 division facts

Written division

÷ = signs and missing numbers

6 ÷ 2 = □	□ = 6 ÷ 2
6 ÷ □ = 3	3 = 6 ÷ □
□ ÷ 2 = 3	3 = □ ÷ 2
□ ÷ ? = 3	3 = □ ÷ ?

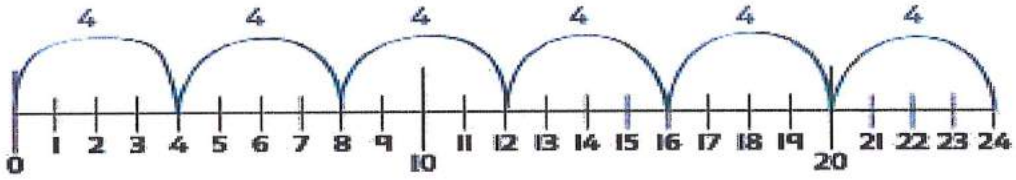
Year 3 Mental Division

Ensure that the emphasis in Year 3 is on grouping rather than sharing.

Learners will continue to use repeated subtraction using a number line.

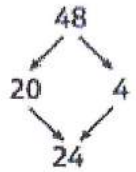
1. Counting in steps:

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



2. Doubling and halving:

Find half of even numbers to 100 using partitioning



Use halving as a strategy in dividing by 2

e.g. 36 ÷ 2 is half of 36 = 18

Find half of odd numbers

Year 3 Mental Division continued

3. Grouping:

Recognise that division is not commutative

e.g. 16 ÷ 8

Relate division to multiplications 'with holes in'

e.g. ? x 5 = 30 is the same

How many 5s make £30?

Divide multiples of 10 by 1 digit numbers

e.g. 240 ÷ 8 = 30

Begin to use subtraction of multiples of 10 of the divisor to divide numbers above the 10th multiple

e.g. 52 ÷ 4 is 10 x 4 (40) and 3 x 4 (12) = 13

4. Using number facts:

Know half of even numbers to 40

Know half of multiples of 10 to 200

e.g. half of 170 is 85

Know x2, x3, x4, x5, x8, x10 division facts

Remainders:

16 ÷3 = 5r1

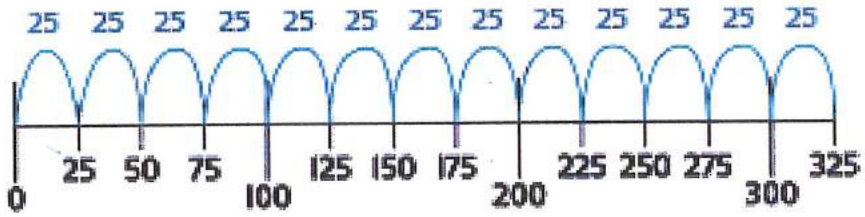
Sharing—16 shared between 3, how many left over?

Grouping—how many 3s make 16, how mnay left over?

Year 4 Mental Division

1. Counting in steps (sequences):

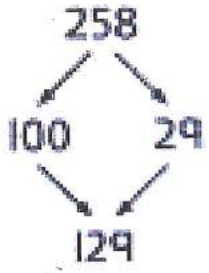
Count in 2s, 3s, 4s, 5s, 6s, 7s, 8s, 9s, 10s, 11s, 12s, 25s, 50s, 100s and 1000s



2. Doubling and halving:

Find half of even numbers to 200 and beyond using partitioning

e.g. Find half of 258



Begin to halve amounts of money

e.g. £9 halved is £4.50

Use halving as a strategy in dividing by 2, 4 and 8

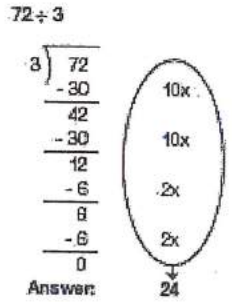
e.g. 164 ÷ 4 is half of 164 (82) halved again = 41

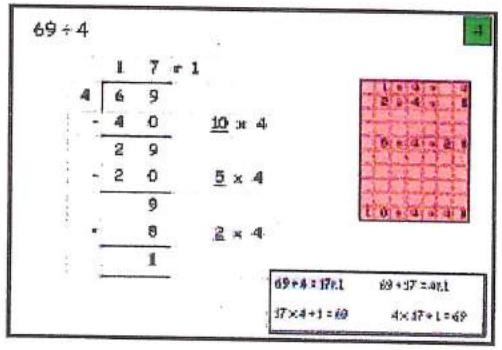
Year 4 Mental Division continued

3. Grouping:

Use multiples of 10 times the divisor to divide by 1 digit numbers above the tables facts

e.g. 72 ÷ 3 as 20 x 3 (60) and 4 x 3 (12) = 24





Any remainders should be shown as integers i.e. 17 r1 or

17 remainder 1.

Learners need to be able to decide what to do after division and round up or down accordingly. They should make sensible decisions about rounding up or down after division. For example 62 ÷ 8 is 7 remainder 6, but whether the answer should be rounded up to 8 or rounded down to 7 depends on the context.

Divide multiples of 100 by 1 digit numbers using division facts

e.g. 3200 ÷ 8 = 400

Sharing and grouping
30 ÷ 6 can be modelled as:

grouping – groups of 6 placed on no. line and the number of groups counted e.g.
Sharing—sharing amongst 6, the number given to each person.

4. Using number facts:

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

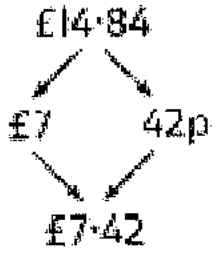
x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	11	24
3	3	6	9	12	15	18	21	24	27	30	22	36
4	4	8	12	16	20	24	28	32	36	40	33	48
5	5	10	15	20	25	30	35	40	45	50	44	60
6	6	12	18	24	30	36	42	48	54	60	55	72
7	7	14	21	28	35	42	49	56	63	70	66	84
8	8	16	24	32	40	48	56	64	72	80	77	96
9	9	18	27	36	45	54	63	72	81	90	88	108
10	10	20	30	40	50	60	70	80	90	100	99	120
11	11	22	33	44	55	66	77	88	99	00	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Year 5 Mental Division

1. Doubling and halving:

Halve amounts of money using partitioning

e.g. half of £14.84 is half of £14 (£7) plus half of 84p (42p)



Use doubling and halving as a strategy in dividing by 2, 4, 8, 5 and 20

e.g. 115 ÷ 5 as a double 115 (230) ÷ 10 = 23

2. Grouping:

Divide numbers by 10, 100, 1000 to obtain decimal answers with up to 3 decimal places

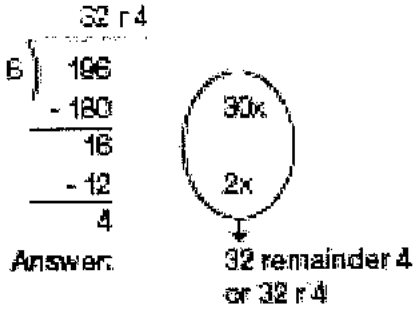
e.g. 340 ÷ 100 = 3.4

Knowing that the effect of dividing by 10 is moving the digits one place to the right.

Knowing that the effect of dividing by 100 is moving the digits 2 places to the right.

Use the 10th, 20th, 30th...multiple of the divisor to divide 'friendly' 2 and 3 digit numbers by a 1 digit number

e.g. 196 ÷ 6 as 30 x 6 (180) and 2 x 6 (12) remainder 4



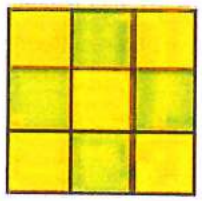
Year 5 Mental Division continued

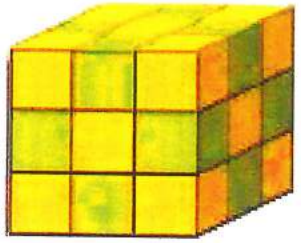
3. Using number facts:

Use division facts from the times tables up to 12 x 12 to divide multiples of powers of 10 of the divisor

e.g. 3600 ÷ 9 using 36 ÷ 9

Know square numbers and cube numbers



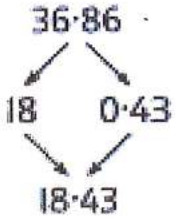


Year 6 Mental Division

1. 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)

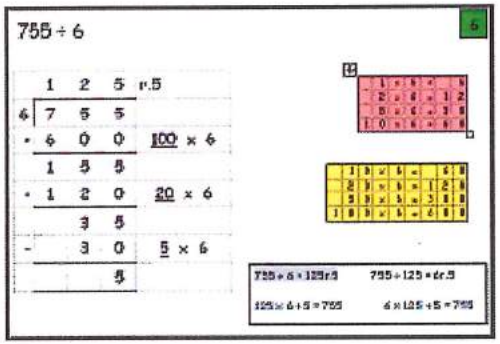


Use doubling and halving as strategies in mental division

2. Grouping:

Use the 10th, 20th, 30th...or 100th, 200th, 300th...multiples of the divisor to divide large numbers

e.g. 755 ÷ 6 = 125 r 5



Use tests for divisibility

e.g. 135 divides by 3, as 1 + 3 + 5 = 9 and 9 is in the x3 table

Year 6 Mental Division continued

2. Using number facts:

Use division facts from the times tables up to 12 x 12 to divide decimal numbers by 1 digit numbers

e.g. 1.17 ÷ 3 is 1/100 of 117 ÷ 3 (39)

Know tests of divisibility for numbers divisible by 2, 3, 4, 5, 9, 10 and 25

Using and applying division facts

Learners should be able to use their knowledge of tables to derive other facts; e.g. If I know 3 x 7 = 21, what else do I know?

30 x 7 = 3 x 7 x 10 = 210

300 x 7 = 3 x 7 x 10 x 10 = 3 x 7 x 100 = 2100

3000 x 7 = 3 x 7 x 10 x 10 x 10 = 3 x 7 x 10 x 100 = 3 x 7 x 1000 = 21 000

0.3 x 7 = (3 x 7) ÷ 10 = 2.1

550 ÷ 50 =
550 ÷ 10 = 55
55 ÷ 5 = 11
550 ÷ 50 = 11

378 ÷ 21 =
378 ÷ 3 = 126
126 ÷ 7 = 18
378 ÷ 21 = 18

Given that 124 x 8 = 992

What is 992 ÷ 8?
or
992 ÷ 124?

Given that 1.4 x 1.1 = 1.54

What is 1.54 ÷ 1.4?
or
1.54 ÷ 1.1?

Year 3 Written Division

Perform divisions just above the 10th multiple using written jottings, understanding how to give a remainder as a whole number.

Use division facts to find unit and simple non-unit cractions of amounts within the times tables

e.g. 3/4 of 48 is 3 x (48 ÷ 8) = 36

÷ = signs and missing numbers

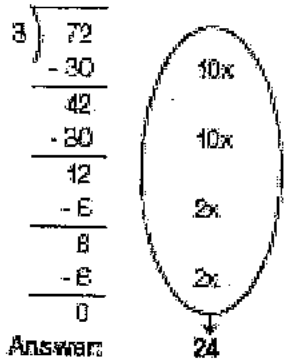
Continue using a range of equations as in Year 2 but with appropriate numbers.

Year 4 Written Division

Use a written version of a mental method to divide 2 and 3 digit numbers by 1 digit numbers

e.g. 72 ÷ 3 as 20 x 3 (60) and 4 x 3 (12)

72 ÷ 3



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) = 48

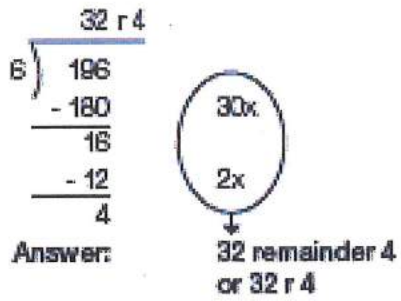
<u>÷ = signs and missing numbers</u>

Continue using a range of equations as in Year 2 but with appropriate numbers.

Year 5 Written Division

Use a written version of a mental strategy to divide 3 digit numbers by 1 digit numbers

e.g. 196 ÷ 6 as 30 x 6 (180) and 2 x 6 (12), remainder 4



Short division of 3 and 4 digit numbers by 1 digit numbers

e.g. 139 ÷ 3

Give remainders as whole numbers or as fractions

Find unit and non-unit fractions of large amounts

e.g. 3/5 of 265 is 3 x (265 ÷ 5) = 159

Turn improper fractions into mixed numbers and vice versa

Year 6 Written Division

Short division of 3 and 4 digit numbers by 1 digit numbers

e.g. 139 ÷ 3

$$\begin{array}{r} 46\ r\ 1 \\ 3\overline{)\,139} \end{array}$$

Long division of 3 and 4 digit numbers by 2 digit numbers

e.g. 4176 ÷ 13

$$\begin{array}{r} 300 + 20 + 1,\ r\ 3 \\ 13\overline{)\,4176} \\ -3900 \\ \hline 276 \\ -260 \\ \hline 16 \\ -13 \\ \hline 3 \end{array}$$

300 x 13

20 x 13

1 x 13

4176 ÷ 13 = 321 r 3

Give remainders as whole numbers, fractions or decimals

Use place value to divide 1 and 2 digit place decimals by numbers ≤ 12

e.g. 3.65 ÷ 5 as (365 ÷ 5) ÷ 100 = 0.73

Divide proper fractions by whole numbers

560 ÷ 50 =
560 ÷ 10 = 55
55 ÷ 5 = 11
560 ÷ 50 = 11

378 ÷ 21 =
378 ÷ 3 = 126
126 ÷ 7 = 18
378 ÷ 21 = 18