Addition

Progression in written calculations

EYFS

Counting songs and reciting number sequences

Counting sets of objects reliably

Finding 1 more (to 20)

Counting on to add 2 single digit numbers

Recording work pictorially

Recording work numerically

3 + 2 = 5

Key Stage 1

Addition can be done in any order

3 + 2 = 2 + 3

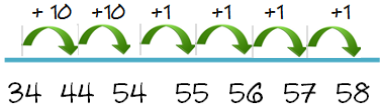
Encourage children to start with the biggest number

Blank number lines to add 2 single digit numbers.

6 + 5 = 11

Blank number lines to add 2 digit numbers

34 + 24 = 58



Partitioning into tens and ones

42 + 16 =
40 + 10 = 50
2 + 6 = 8
50 + 8 = 58

Lower Key Stage 2

Partitioning into hundreds, tens and ones

249 + 116 = 365

200 + 100 = 300
40 + 10 = 50
9 + 6 = 15
300 + 50 + 15 = 365

Expanded column method

86 + 47 =

```
  8 6
+ 4 7
  1 3   (6 + 7)
1 2 0   (80 + 40)
1 3 3
```

Column method with carrying (up to 4 digit numbers)

86 + 47 =

```
  8 6
  4 7
1 3 3
  1
```

Upper Key Stage 2

Column method with increasingly larger numbers

2457 + 1294 =

```
  2 4 5 7
+ 1 2 9 4
  3 7 5 1
    1 1
```

Column method to add decimal numbers

159.54 + 64.29 =

```
  1 5 9 . 5 4
+   6 4 . 2 9
  2 2 3 . 8 3
  1 1     1
```

Subtraction

Progression in written calculations

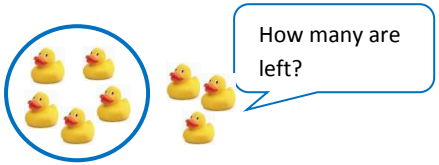
EYFS

Number rhymes and reciting number sequences

Finding 1 less (to 20)

Counting back to subtract 2 single digit numbers

Removing objects from a group



Recording work pictorially

Recording work numerically

5 – 3 = 2

Key Stage 1

Counting back in 2s, 5s, 10s (Yr1) and 3s (Yr2) orally and using 100 square.

Removing objects from sets

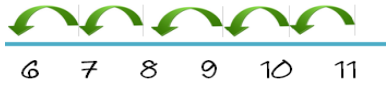
Finding the difference by counting on

The difference between 11 and 6

6 + 5 = 11

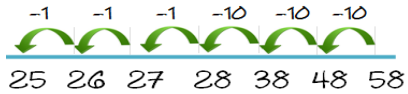
Blank number lines to subtract single digit numbers

11 – 5 = 6



Blank number lines to subtract 2 digit numbers

58 – 33 = 25



Explore the link between inverse operations

Lower Key Stage 2

Blank number lines to subtract 2 digit numbers using larger jumps

58 – 33 = 25

Partitioning (practical method using place value counters, working towards written column method)

156 – 34

100 + 50 + 6
– 30 + 4
100 + 20 + 2 = 122

Column method to subtract 3 and 4 digit numbers

156 – 38 =

1 $^{4}\cancel{5}$ ^{1}6
– 3 8
1 1 8

Upper Key Stage 2

Column method to subtract 4 digit numbers

2156 – 938 = 1218

^{1}2 ^{1}1 $^{4}\cancel{5}$ ^{1}6
– 9 3 8
1 2 1 8

Column method to subtract decimal numbers

359.54 + 164.29 = 195.25

$^{2}\cancel{3}$ ^{1}5 9. $^{4}\cancel{5}$ ^{1}4
– 1 6 4. 2 9
1 9 5. 2 5

Multiplication

Progression in written calculations

EYFS

Songs with counting jumps

(Ants go marching)

Identifying sets of objects which are the same size

Combining sets of objects which are the same size

Grouping objects into 2s and 10s

Counting in 2s, 5s and 10s

Doubling using objects

Key Stage 1

Practical methods leading to pictorial recording (Ponds and Fish)

3 x 3 = 9

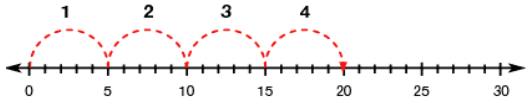
Dot Arrays

factor factor product

3 × 6 = 18

number of groups | number in each group | number in all

Number Lines



factor 4 x factor 5 = product 20

Multiplication can be done in any order

3 x 6 = 6 x 3

Times Tables

Year 2 children should know their 2, 5 and 10 times tables.

Lower Key Stage 2

Grid Method (as a step towards formal written methods)

35 x 7 = 245

×	30	5
7	210	35

210 + 35 = 245

Short Multiplication

24 × 6 becomes

	2	4
×		6
1	4	4
	2	

Answer: 144

Times Tables

Year 3 children should know their 2, 3, 4, 5, 8 and 10 times tables

Year 4 children should know all their tables up to and including 12 x12.

Upper Key Stage 2

Short multiplication for 2, 3 and 4 digit by 1 digit multiplication

2741 × 6 becomes

	2	7	4	1
×				6
1	6	4	4	6
	4	2		

Answer: 16 446

Long multiplication for 2 and 3 digits by 2 digit numbers

124 × 26 becomes

	1	2	4
×		2	6
	7	4	4
2	4	8	0
3	2	2	4
1	1		

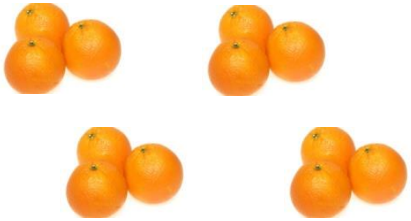
Answer: 3224

Division

Progression in written calculations

EYFS

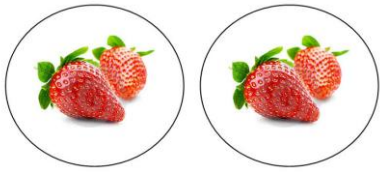
Sharing objects fairly between groups of children.



Cutting objects in half. How many pieces

Counting backwards in 2s and 10s

Halving groups of objects

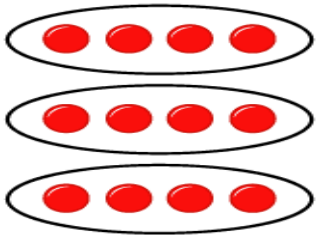


Key Stage 1

Practical methods leading to pictorial recording (Ponds and Fish)

$9 \div 3 = 3$

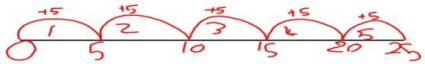
Dot Arrays



$12 \div 4 = 3$

Number Lines (How many 5s are in 25?)

$25 \div 5 = 5$



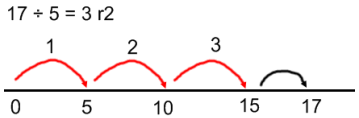
Explore links between inverse operations

Times Tables

Year 2 children should know the division facts for the 2, 5 and 10 times tables.

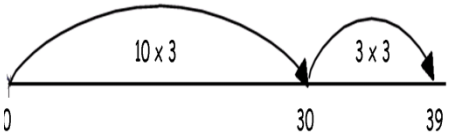
Lower Key Stage 2

Number Lines (With remainders)

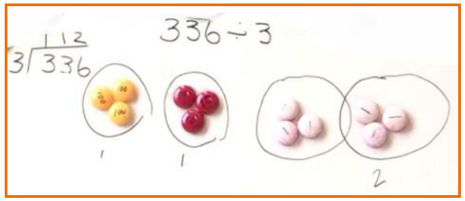


3 groups of 5, 2 left over.

Chunking on a number line:



Progressing to standard written method



Times Tables

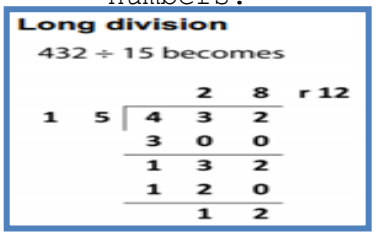
Year 3 should know division facts for the 2, 3, 4, 5, 8 & 10 times tables

Year 4 should know division facts for all tables to 12 x12.

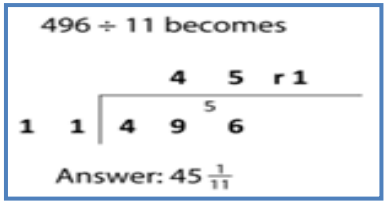
Upper Key Stage 2

Standard written method with remainders.

Long Division for up to 4 digit numbers by 2 digit numbers.



Short Division for up to 4 digit numbers by 2 digit numbers.



Prime Numbers

Identify prime numbers, common factors and common multiples.