



# 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

Blank number lines to add 2 digit numbers

Partitioning into tens and ones

$$\begin{aligned} 40 + 10 &= 50 \\ 2 + 6 &= 8 \\ 50 + 8 &= 58 \end{aligned}$$

### 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

$$86 + 47 =$$

$$\begin{array}{r} 86 \\ + 47 \\ \hline \end{array} \quad \begin{array}{l} (6 + 7) \\ \hline 133 \\ \hline \end{array} \quad \begin{array}{l} (80 + 40) \end{array}$$

Column method with carrying (up to 4 digit numbers)

$$86 + 57 =$$

$$\begin{array}{r} 86 \\ + 57 \\ \hline 143 \end{array}$$

### Upper Key Stage 2

Column method with increasingly larger numbers

$$2457 + 1294 =$$

$$\begin{array}{r} 2457 \\ + 1294 \\ \hline 3751 \end{array}$$

Column method to add decimal numbers

$$159.54 + 64.29 =$$

$$\begin{array}{r} 159.54 \\ + 64.29 \\ \hline 223.83 \end{array}$$

# Subtraction

## Progression in written calculations

### EYFS

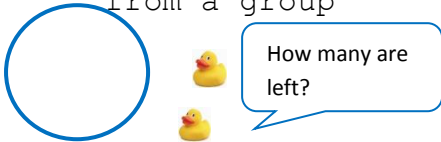
Number rhymes and reciting number sequences

Finding 1 less (to 20)

Counting back to subtract 2 single digit numbers



Removing objects from a group



Recording work pictorially

Recording work numerically

$$7 - 3 = 4$$

### 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**

Blank number lines to subtract single digit numbers

Blank number lines to subtract 2 digit numbers

### Lower Key Stage 2

Blank number lines to subtract 2 digit numbers using larger jumps

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

$$\begin{array}{r} 156 - 34 \\ 100 + 50 + 6 \\ - 30 + 4 \\ \hline 100 + 20 + 2 = 122 \end{array}$$

Column method to subtract 3 and 4 digit numbers

$$\begin{array}{r} 156 - 38 = \\ \begin{array}{r} 1 \quad ^4 5 \quad ^1 6 \\ - \quad \quad 3 \quad 8 \\ \hline 1 \quad 1 \quad 8 \end{array} \end{array}$$

### Upper Key Stage 2

Column method to subtract 4 digit numbers

$$2156 - 938 = 1218$$

$$\begin{array}{r} \quad ^1 2 \quad ^1 1 \quad ^4 5 \quad ^1 6 \\ - \quad \quad \quad 9 \quad 3 \quad 8 \\ \hline \quad 1 \quad 2 \quad 1 \quad 8 \end{array}$$

Column method to subtract decimal numbers

$$359.54 - 164.29 = 195.25$$

$$\begin{array}{r} \quad ^2 3 \quad ^1 5 \quad 9 \quad ^4 5 \quad ^1 4 \\ - \quad 1 \quad 6 \quad 4 \quad 2 \quad 9 \\ \hline \quad 1 \quad 9 \quad 5 \quad 2 \quad 5 \end{array}$$



# 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



Pictorial recording

### Key Stage 1

Practical methods leading to pictorial recording  
(Ponds and Fish)

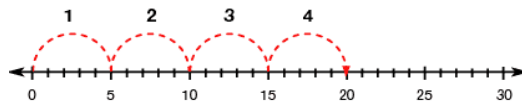
$$3 \times 3 = 9$$



factor factor product

$$3 \times 6 = 18$$

number of groups    number in each group    number in all



factor 4 x factor 5 = product 20

### 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)

$$35 \times 7 = 245$$

X	30	5
7	210	35

$$210 + 35 = 245$$

Short Multiplication

24 x 6 becomes

	2	4
x		6
	1	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 x 12.

### Upper Key Stage 2

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

2741 x 6 becomes

	2	7	4	1
x				6
	1	6	4	4
		4	2	

Answer: 16 446

Long multiplication for 2 and 3 digits

124 x 26 becomes

	1	2	4
x		2	6
	7	4	4
	2	4	8
	3	2	2
	1	1	

Answer: 3224



# Division



## Progression in written calculations

### EYFS

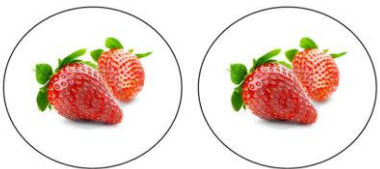
Sharing objects fairly between groups of children.



Cutting objects in half. How many pieces are there?

Counting backwards in 2s and 10s

Halving groups of objects



### Key Stage 1

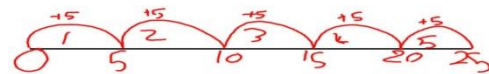
Practical methods leading to pictorial recording (Ponds and Fish)

$$9 \div 3 = 3$$

Dot Arrays

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

$$25 \div 5 = 5$$



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.