

Maths in KS2  
Miss Begum  
KS2 Maths Co-ordinator  
Assistant Head

# Addition - Year 4

## End of Year Expectation:

*Add numbers with up to 4 digits using the formal written method of column addition where appropriate.*

**1**  $176 + 147 = 323$

$$\begin{array}{r} 176 \\ + 147 \\ \hline + 13 \quad (7 + 6) \\ 110 \quad (70 + 40) \\ \hline 200 \quad (100 + 100) \\ \hline 323 \end{array}$$

Further develop the formal written method of addition, with with three-digit numbers.

Revisit the expanded method first, if necessary:

2

**$176 + 147 = 323$**

$$\begin{array}{r} 147 \\ + 176 \\ \hline 323 \\ \hline \end{array}$$

Use the language of place value to ensure understanding:

*'Seven add six equals 13. Write three in the units column and 'carry' one across into the tens column (10).*

*40 add 70 and the ten that we carried equals 120.*

*Write 2 in the tens column (20) and 'carry' 1 across into the hundreds column (100). 100 add 100 and the 100 that has been carried equals 300.*

*Write 3 in the hundreds column (300).*

If children are confident, introduce the addition of a four-digit number and a three digit number:

$$1845 + 526 = 2371$$

$$\begin{array}{r} 1845 \\ + 526 \\ \hline 2371 \\ \hline \end{array}$$

Continue to develop with addition of two four-digit numbers and with decimals (in the the context of money or measures).

Children use and apply this method to money and measures.

**Key vocabulary** add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact, **thousands**, **hundreds**, **digits**, **inverse**

# Addition - Year 5

## End of Year Expectation:

Add whole numbers with more than 4 digits, including using formal written method (columnar addition)

1

$$21848 + 1523 = 23371$$

$$\begin{array}{r} 21848 \\ + 1523 \\ \hline 23371 \\ \hline \end{array}$$

Continue to use the language of place value to ensure understanding.

Ensure that the digits that have been 'carried' are recorded recorded under the line in the correct column.

2

Use the formal written method for the addition of decimal numbers:

$$£154.75 + £233.82 = £388.57$$

$$\begin{array}{r} 154.75 \\ + 233.82 \\ \hline 388.57 \\ \hline \end{array}$$

Ensure that the decimal points line up.

Key vocabulary add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths.

# Addition - Year

## End of Year Expectation:

Use formal written method (columnar addition) for larger numbers and decimals

1

$$21848 + 1523 = 23371$$

$$\begin{array}{r} 21848 \\ + 1523 \\ \hline 23371 \\ \hline \end{array}$$

Continue to use the language of place value to ensure ensure understanding.

Ensure that the digits that have been 'carried' are recorded under the line in the correct column.

- 2 Use the formal written method for the addition of decimal numbers:

$$£154.75 + £233.82 = £388.57$$

$$\begin{array}{r} 154.75 \\ + 233.82 \\ \hline 388.57 \\ \hline \end{array}$$

**Key vocabulary** add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, units, partition, addition, column, tens boundary, hundreds boundary, increase, vertical, 'carry', expanded, compact, thousands, hundreds, digits, inverse, decimal places, decimal point, tenths, hundredths, thousandths.

# Subtraction - Year 4

## End of Year Expectation:

Subtract numbers with up to 4 digits using the formal written method of columnar subtraction where appropriate

Continue to develop the formal written method of subtraction by revisiting the expanded expanded method first, if necessary.

Continue to use base-ten materials to support understanding.

1    **258 - 73 = 185**

$$\begin{array}{r} 200 + 50 + 8 \\ - \quad 70 + 3 \\ \hline \end{array}$$

becomes

$$\begin{array}{r} 100 + 150 + 8 \\ - \quad 70 + 3 \\ \hline 100 + 80 + 5 = 185 \end{array}$$

$$\begin{array}{r} 1 \quad 15 \\ 2 \quad 5 \quad 8 \\ - \quad 7 \quad 3 \\ \hline 1 \quad 7 \quad 5 \end{array}$$

Further develop by subtracting a three-digit number from a three-digit number:

**637 - 252 = 385**

$$\begin{array}{r} 600 + 30 + 7 \\ - \quad 200 + 50 + 2 \\ \hline \end{array}$$

$$\begin{array}{r} 500 + 130 + 7 \\ - \quad 200 + 50 + 2 \\ \hline 300 + 80 + 5 = 385 \end{array}$$

$$\begin{array}{r} 5 \quad 13 \\ 6 \quad 3 \quad 7 \\ - \quad 2 \quad 5 \quad 2 \\ \hline 3 \quad 8 \quad 5 \end{array}$$



# Subtraction -

Year 5 End of Year Expectation:

Subtract whole numbers with more than 4 digits, including using formal written method (columnar subtraction)

$$\begin{array}{r} 4 \quad 9 \quad 13 \\ \del{503} \\ - 278 \\ \hline 225 \end{array}$$

There are no tens in the first number (503) so we have to exchange a hundred for 10 tens before we can exchange a ten for ten ones/units

$$12731 - 1367 = 11364$$

$$\begin{array}{r} 6 \quad 12 \quad 11 \\ 12731 \\ - 1367 \\ \hline 11364 \end{array}$$

*In this example it has been necessary to exchange from the tens and the hundreds columns.*

$$\pounds 166.25 - \pounds 83.72 = \pounds 82.53$$

$$\begin{array}{r} 16 \quad 5 \quad 12 \\ 166.25 \\ - 83.72 \\ \hline 82.53 \end{array}$$



# Multiplication - Year 4

## End of Year Expectation:

- > Recall multiplication facts for multiplication tables up to  $12 \times 12$
- > Multiply two-digit and three-digit numbers by a one-digit number using formal written layout

1

Further develop the grid method for two-digit numbers multiplied by a one-digit number.

X	30	6
4	120	24

$$120 + 24 = 144 \text{ (add the partial products)}$$

2

Expanded short multiplication (two-digit number by a one-

$$36 \times 4 = 144$$

$$\begin{array}{r} 36 \\ \times 4 \\ \hline + 24 \quad (4 \times 6) \\ 120 \quad (4 \times 30) \\ \hline 144 \end{array}$$

Include an addition symbol when adding partial products.

- 3 This leads to short multiplication (formal method) of a two-digit number multiplied by a one-digit number:

$$36 \times 4 = 144$$

$$\begin{array}{r} 36 \\ \times 4 \\ \hline 144 \\ \hline 2 \end{array}$$

Use the language of place value to ensure understanding.  
Ensure that the digit 'carried over' is written under the line in the correct column.

Continue to practise the formal method of short multiplication of a two-digit number by a one-digit number throughout Y4.

- 4 If children are confident, continue to develop short multiplication with three-digit numbers multiplied by a one-digit number.

$$127 \times 6 = 762$$

$$\begin{array}{r} 127 \\ \times 6 \\ \hline 42 \quad (6 \times 7) \\ + 120 \quad (6 \times 20) \\ \hline 600 \quad (6 \times 100) \\ \hline 762 \end{array}$$

then onto  
this...



$$\begin{array}{r} 127 \\ \times 6 \\ \hline 762 \\ \hline 1 \quad 4 \end{array}$$

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value, **inverse**

# Multiplication - Year 5

## End of Year Expectation:

Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers

1

When children are confident introduce multiplication by a two-digit number.

If necessary, ret method first.  $23 \times 13 = 299$  and/or expanded

$$\begin{array}{r} 23 \\ \times 13 \\ \hline 69 \\ 230 \\ \hline 299 \end{array}$$

Expanded long multiplication  
(two-digit numbers multiplied by  
a teen- number):

2

Compact long multiplication (formal  
method):

$$23 \times 13 = 299$$

Use the language of place value to ensure  
understanding.  
Add the partial products.

$$\begin{array}{r} 23 \\ \times 13 \\ \hline + 69 \\ 230 \\ \hline \underline{299} \end{array}$$

3

Two-digit numbers multiplied by two-digit numbers):

$$56 \times 27 = 1512$$

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 42 \\ 350 \\ + 120 \\ \hline 1000 \\ \hline 1512 \\ \uparrow \end{array} \begin{array}{l} (7 \times 6) \\ (7 \times 50) \\ (20 \times 6) \\ (20 \times 50) \end{array}$$

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 39^4 2 \\ + 11^1 20 \\ \hline 1512 \\ \hline 1 \end{array}$$

Expanded method .... Moving onto .... Compact long multiplication.

4

When children are confident with long multiplication extend with three-digit numbers multiplied by a two-digit number.

$$124 \times 26 = 3224$$

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 7^1 4^2 4 \\ + 2480 \\ \hline 3224 \\ \hline 1 \quad 1 \end{array}$$

Use the language of place value to ensure understanding.

Add the partial products. Extend with short and long multiplication of decimal numbers (initially in the context of money and measures), returning to an expanded method first (see Y6 guidance).

**Key vocabulary** groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value, inverse, **square, factor, integer, decimal, short/long multiplication, 'carry'**

# Multiplication -

## Year 6 End of Year Expectation:

Multiply multi-digit numbers (including decimals) up to 4 digits by a two-digit whole numbers

The grid method (decimal number multiplied by a two-digit number):

$$53.2 \times 24 = 1276.8$$

x	50	3	0.2	
20	1000	60	4	1064.0
4	200	12	0.8	212.8
				1276.8

The formal written method of long multipli

$$53.2 \times 24 = 1276.8$$

$$\begin{array}{r} 53.2 \\ \times 24.0 \\ \hline 212.8 \\ 1064.0 \\ \hline 1276.8 \end{array}$$

It is an option to include .0 in this example, but not essential.

The prompts (in brackets) can be omitted if children do not need them.

$$(53.2 \times 4)$$

$$(53.2 \times 20)$$

Key vocabulary groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, column, row, sets of, equal groups, times as big as, once, twice, three times..., partition, grid method, multiple, product, tens, units, value, inverse, **square**, **factor**, **integer**, **decimal**, short/long multiplication, 'carry', tenths, hundredths, decimal

Develop fluency in mathematical talk or patter

e.g.

" My question is 32 divided by 8.

I know that the inverse will be  $? \times 8 = 32$

so how many 8's make 32? 8, 16, 24, 32 = 4

$4 \times 8 = 32$  so 32 divided by 8 is 4"

Using facts that I already know eg:

$$120 \div 4 =$$

$$\text{I know that } 10 \times 4 = 40$$

$$\text{so } 20 \times 4 = 80$$

$$30 \times 4 = 120$$

$$\text{repeated addition } 40 + 40 + 40 = 120$$

Use the formal written layout for division using multiplication tables that

they know:

'How many eights are there in thirty two?'

$$\begin{array}{r} 4 \\ \hline 8 \overline{) 32} \end{array}$$

Continue using the formal written layout, introducing remainders:

$$\begin{array}{r} 8 \text{ r } 1 \\ \hline 3 \overline{) 25} \end{array}$$

# Division - Year 4

## End of Year Expectation:

- > Recall multiplication and division facts for multiplication tables up to  $12 \times 12$ .
- > Use place value, known and derived facts to divide mentally.
- > Divide two-digit and three-digit numbers by a one-digit number using formal written layout.

1

Continue to write and calculate mathematical statements for division using the multiplication tables that the children know e.g.

$$32 \div 8 = \quad 63 \div 9 = 7$$

$$400 \div 10 = \quad 24 \div 2 =$$

$$10 \quad 12$$

2

*Continue using the formal written layout, introducing remainders:*

$$\begin{array}{r} 8 \text{ r } 1 \\ \hline 3 \overline{) 25} \end{array}$$

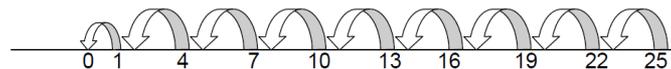
Continue using the formal written layout for division using multiplication tables that they know:

$$\begin{array}{r} 4 \\ \hline 8 \overline{) 32} \end{array}$$

'How many eights are there in thirty two?'

This could be modelled using an empty number line, if necessary:

'Eight jumps of three and one left over.'



This will lead into the formal written method of long division:

$$98 \div 7 = 14$$

$$\begin{array}{r} 14 \\ \hline 7 \overline{) 98} \\ \underline{-7} \phantom{0} \\ \phantom{0} \phantom{0} \phantom{0} \end{array}$$

*If children are confident develop further, by dividing three-digit numbers by a one digit number using the formal method of long division with whole number answers (no remainders).*

$$\begin{array}{r} \phantom{0} \phantom{0} \phantom{0} \\ \hline 28 \\ \hline - 28 \\ \hline 0 \end{array}$$

**Key vocabulary** share, share equally, one each, two each..., group, equal 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**

# Division - Year 5

## End of Year Expectation:

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.

Continue to practise the formal written method of long division with whole number answers.

$$184 \div 8 = 23$$

$$\begin{array}{r} 23 \\ 8 \overline{) 184} \\ \underline{- 16} \phantom{4} \\ 24 \\ \underline{- 24} \\ 0 \end{array}$$

Use the language of place value to ensure understanding.

Continue to practise the formal written method of long division with remainders:

$$432 \div 5 = 86 \text{ r}2$$

$$\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \\ \underline{40} \phantom{2} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

The remainder can also be expressed as a fraction, (the remainder divided by the divisor):

$$432 \div 5 = 86\frac{2}{5}$$

# Division - Year 6

## End of Year Expectation:

> Divide numbers up to 4 digits by a two-digit number using the formal written method of long division where appropriate, interpreting remainders according to the context.

> 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.

$$496 \div 11 = 45 \text{ r}1$$

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{-440} \phantom{0} \\ 56 \\ \underline{-55} \\ 1 \end{array}$$

$$432 \div 15 = 28.8$$

Multiples of the divisor (11) have been subtracted from the dividend (496)

'40 (lots of 11) + 5 (lots of 11) = 45 (lots of 11)'

'1 is the remainder'

Answer:  $45\frac{1}{11}$

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \phantom{0} \phantom{0} \phantom{0} \\ 132 \phantom{0} \phantom{0} \phantom{0} \\ \underline{120} \phantom{0} \phantom{0} \\ 120 \phantom{0} \\ \underline{120} \\ 0 \end{array}$$