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*St Margaret Clitherow's Catholic  
Voluntary Primary Academy*

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# Y6 Maths

## Calculation Expectations

This booklet will explain how addition, subtraction, multiplication and division are taught in Year 6.

The methods explained are the 'end of year expectation' that children will be taught throughout the year. For those children who are still developing their understanding of the four calculations, they will practise methods from the previous year group. When children are ready, they will begin to practise the expected method.

If you have any further questions, please contact your child's class teacher.

## Overview of calculation methods for Year 6

### End of year expectations

#### Addition (+)

- Compact column method

#### Subtraction (-)

- Compact column method

#### Multiplication (x)

- Short and long multiplication

#### Division ( $\div$ )

- Short and long division

# Addition

Year 6



## Addition in Year 6

### Key Vocabulary

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

### Key skills for addition at Year 6

- Perform mental calculations, including with mixed operations and large numbers, using and practising a range of mental strategies.
- Solve multi-step problems in context, deciding which operations and methods to use and why.
- Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
- Read, write, order and compare numbers up to 10 million and determine the value of each digit.
- Round any whole number to a required degree of accuracy.
- Pupils understand how to add mentally with larger numbers and calculations of increasing complexity.

# Addition

Year 6



POS - Add several numbers of increasing complexity.

Children must be able to recognise the place value of **tenths** and **hundredths** and use this to align numbers with different numbers of decimal places.

## Key Vocabulary

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

## End of year expectation

Solve increasingly complex addition problems using the **compact column** method.

$$\begin{array}{r} 23.361 \\ + 9.080 \\ \hline 32.441 \end{array}$$

Empty decimal places can be filled with zero to show the place value in each column.

The decimal point should be aligned in the same way as the other columns and must be in the same column in the answer.

$$\begin{array}{r} 81,059 \\ + 3,668 \\ \hline 84,727 \end{array}$$

Include addition of money, measures and decimals with different numbers of decimal places.

# Subtraction

Year 6

## Subtraction in Year 6

### Key Vocabulary

*equal to, take, take away, less, minus, subtract, leaves, difference between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is\_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse, value, digit, tenths, hundredths, decimal point, decimal, exchange*

### Key skills for subtraction at Year 6

- Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
- Read, write, order and compare numbers up to 10 million and determine the value of each digit
- Round any whole number to a required degree of accuracy
- Use negative numbers in context, and calculate intervals across zero
- Children need to utilise and consider a range of mental subtraction strategies, jotting and written methods before choosing how to calculate.
- Use the inverse to check whether calculations are correct.

### Mental skills

Pupils should be able to apply their knowledge of a range of mental strategies, mental recall skills, and informal and formal written methods when selecting **the most appropriate method** to work out subtraction problems.

# Subtraction

Year 6

POS - Subtracting with increasingly large and more complex numbers and decimal values.

Children are to use the compact column methods to subtract money and measures, including decimals with different numbers of decimal places and complex integers.

## Key Vocabulary

equal to, take, take away, less, minus, subtract, leaves, difference between, how many more, how many fewer / less than, most, least, count back, how many left, how much less is\_? difference, count on, strategy, partition, tens, units exchange, decrease, hundreds, value, digit, inverse, value, digit, tenths, hundredths, decimal point, decimal, exchange

### End of year expectation -

Subtracting using the **compact column subtraction** method with decimal values.

E.g.

$$\begin{array}{r} \overset{6}{7} \overset{10}{X} \overset{8}{6} \overset{9}{9} \cdot \overset{0}{0} \\ - \quad \quad \quad 372 \cdot 5 \\ \hline 6796 \cdot 5 \end{array}$$

Using the **compact column** method to subtract money and measures, including decimals with different numbers of decimal places.

$$\begin{array}{r} \overset{0}{X} \overset{100}{5} \overset{9}{0}, \overset{6}{6} \overset{9}{9} \overset{9}{9} \\ - \quad \quad \quad 89,949 \\ \hline 60,750 \end{array}$$

Use the compact column method to subtract more complex integers.

$$\begin{array}{r} \overset{0}{X} \overset{10}{5} \cdot \overset{3}{4} \overset{11}{1} \overset{9}{9} \text{ kg} \\ - \quad \quad \quad 36 \cdot 08 \text{ kg} \\ \hline 69 \cdot 339 \text{ kg} \end{array}$$

Add a 'zero' in any empty decimal place to show the place value in each column.

# Multiplication

Year 6



## Multiplication in Year 6

### Key Vocabulary

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

### Key skills for multiplication at Year 6

- Multiply multi-digit numbers, up to 4-digit  $\times$  2-digit using long multiplication.
- Perform mental calculations with mixed operations and large numbers.
- Solve multi-step problems in a range of contexts, choosing appropriate combinations of operations and methods.
- Estimate answers using round and approximation and determine levels of accuracy.
  - Round any integer to a required degree of accuracy.
  - Moving digits when  $\times$  by 10, 100 and 1000

### Mental skills

Recall multiplication facts for all times tables up to **12  $\times$  12** (as Y4 and Y5).

# Multiplication

Year 6

X

POS - Multiply multi-digit numbers up to 4-digits by a 2-digit whole number.

Children should be able to:

- Use rounding and place value to make approximations before calculating and use these to check answers against.
- Use **short multiplication** to multiply numbers with **more than 4-digits by a single digit**; to multiply money and measures, and to **multiply decimals with up to 2d.p. by a single digit**.
- Use **long multiplication** (see Y5) to multiply numbers with **at least 4 digits by a 2-digit number**.

## Key Vocabulary

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

## End of year expectation

Multiply numbers up to 4-digits by a 2-digit whole number using long multiplication.

$$\begin{array}{r} 1234 \\ \times 16 \\ \hline 7404 \\ 12340 \\ \hline 19744 \end{array}$$

Line up the decimal points in the question and the answer.

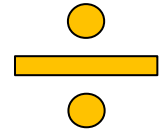
Remind children that the single digit belongs in the units column.

Use short multiplication to multiply a number with 2dp by a 1-digit number.

$$\begin{array}{r} 3.19 \\ \times 8 \\ \hline 25.52 \end{array}$$

# Division

Year 6



## Division in Year 6

### 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, inverse, quotient, prime number, prime factors, composite number (non-prime), **common factor***

### Key skills for division at Year 6

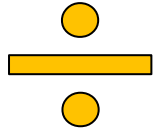
- Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. Use short division where appropriate.
- Identify common factors, common multiples 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.
- 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.
- Moving digits when  $\div$  by 10, 100 and 1000

### Mental skills

- Recall and use multiplication and division facts for all numbers to  $12 \times 12$  for more complex calculations.
- Perform mental calculations, including with mixed operations and large numbers.

# Division

Year 6



POS - Divide at least 4-digits by both single-digit and 2-digit numbers (including decimal numbers and quantities).

**Children should:**

Express remainders as fractions, decimals or use rounding (depending on the problem).

**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, inverse, **quotient, prime number, prime factors, composite number (non-prime)***

**End of year expectation**

Short division of 4-digit numbers by a single digit (calculating the decimal).

E.g.  $6497 \div 8 = 812.125$

Short division

Dividing at least 4-digit numbers by 2-digits by long division (chunking).

Create a 'useful list' at the side to help decide which chunks to use, e.g.:  
 $10 \times 36 = 360$   
 or write a list increasing by 36s

Find out 'How many 36s are in 1728?' by **subtracting 'chunks'** of 36 until zero is reached (or until there is a remainder).