St Margaret Clitherow's Catholic Voluntary Primary Academy

Y5 Maths

Calculation Expectations

This booklet will explain how addition, subtraction, multiplication and division are taught in Year 5.

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 5

End of year expectations

Addition (+)

- Compact column method

Subtraction (-)

- Compact column method

Multiplication (x)

- Short and long multiplication

Division (÷)

- Short and long division

Addition

Year 5

Addition in Year 5

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 5

- Add numbers mentally with increasingly large numbers, using and practising a range of mental strategies i.e. add the nearest multiple of 10, 100, 100 and adjust; use near doubles, inverse, partitioning and re-combining; using number bonds.
- Use rounding to check answers and accuracy.
- Solve multi-step problems in contexts, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000.
- Add numbers with more than 4 digits using formal written method of column addition.

Addition

Year 5

POS – Add numbers with more than 4-digits.

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, compactdigits, inverse & ***decimal places, decimal point, tenths, hundredths, thousandths***

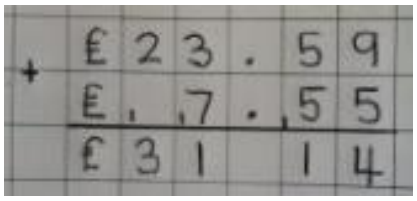
End of year expectation - Add numbers with up to 4-digits using the **compact column** method.

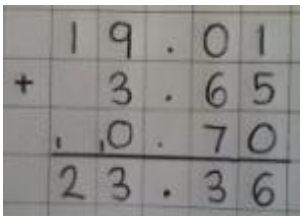
Add numbers with more than 4-digits using the **compact column** method.

Reinforce correct place value. The actual value is 500 + 300, not 5 + 3.

Steps to success:
-add the units
- add the tens
- add the hundreds
- add the thousands
- carry 'on the doorstep'

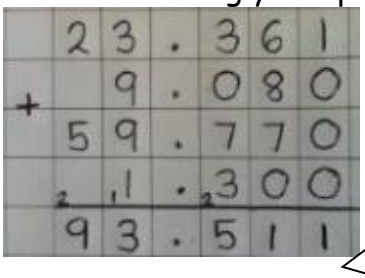
Include addition of money, measures and decimals with different numbers of decimal places.





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

Solve increasingly complex addition problems.



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

Steps to success:
- add the thousandths
- add the hundredths
- add the tenths
- add the units
- add the tens
- carry 'on the doorstep'

Subtraction

Year 5

Subtraction in Year 5

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***

Key skills for subtraction at Year 5

- Subtract numbers mentally with increasingly large numbers.
- Use rounding and estimation to check answers to calculations and determine, in a range of contexts, levels of accuracy.
- Solve addition and subtraction multi-step problems in context, deciding which operations and methods to use and why.
- Read, write, order and compare numbers to at least 1 million and determine the value of each digit.
- Count forwards or backwards in steps of powers of 10 for any given number up to 1 million.
- Interpret negative numbers in context, counting forwards and backwards with positive and negative integers through 0.
- Round any number up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.

Subtraction

Year 5

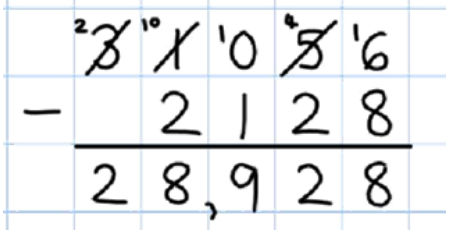
POS – Subtracting with at least 4-digit numbers.

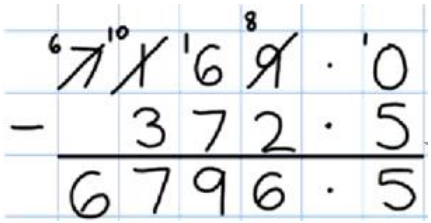
Create lots of opportunities for subtracting and finding differences with money and measures.

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***

End of year expectation - Subtracting using the **compact column subtraction** method.





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

Create lots of opportunities for subtracting and finding differences with money and measures.

Multiplication

Year 5

Multiplication in Year 5

Key Vocabulary

groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, 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, 'carry'***

Key skills for multiplication at Year 5

- Identify multiples and factors, using knowledge of multiplication tables to 12 x 12.
- Solve problems where larger numbers are decomposed into their factors.
- Multiply and divide integers and decimals by 10, 100 and 1000.
- Round numbers up to 1 million to the nearest 10, 100, 1000, 10 000 and 100 000.
- Use rounding to check answers to calculations.
- Recognise and use square and cube numbers and their notation.
- Solve problems involving combinations of operations, choosing and using calculations and methods appropriately.

Mental skills

To recall all multiplication facts to 12 x 12.

Multiplication

Year 5

×

POS – Multiply numbers up to **4-digits by a 1- digit number.**

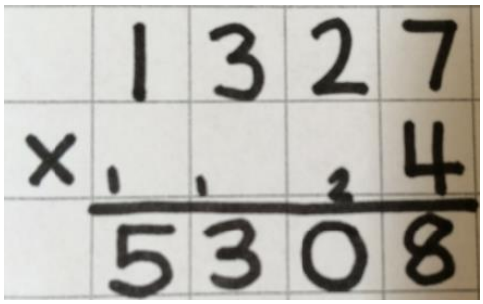
Approximate **Calculate** **Check it mate!**

Children need to be taught to approximate first, e.g. for **72 x 3, they will use rounding: 70 x 3** is approximately 70 x 3 = **210**, and use the approximation to check the reasonableness of their answer against.

Key Vocabulary

groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, 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, 'carry'***

End of year expectation – **Short multiplication** for multiplying by a single digit.



Steps to success:

Multiply every digit in turn by the 1-digit number

Carry 'on the doorstep' and remember to add what you have carried over.

Multiplication

Year 5

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

Approximate **Calculate** **Check it mate!**

Children need to be taught to approximate first, e.g. for **72 x 38, they will use rounding: 72 x 38** is approximately 70 x 40 = **2800**, and use the approximation to check the reasonableness of their answer against.

Key Vocabulary

groups of, lots of, times, array, altogether, multiply, count, multiplied by, repeated addition, 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, 'carry'***

End of year expectation

Multiply numbers up to 4-digits by a 2-digit number using **long multiplication** – moving on to multiplying more complex numbers.

Steps to success:

- Multiply all digits by the unit
- Add the tens place holder
- Multiply by the tens

Carry 'on the doorstep' and remember to add what you have carried over.

Add the two rows.

Division

Year 5

Division in Year 5

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)***

Key skills for division at Year 5

- Identify multiples and factors, including finding all factor pairs of a number, and common factors of two number.
- Solve problems involving multiplication and division where larger numbers are decomposed into their factors.
- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
- Use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.
- Work out whether a number up to 100 is prime, and recall prime numbers to 19.
- 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
- Use multiplication and division as inverses.
- Interpret non-integer answers to division by expressing results in different ways according to the context, including with remainders, as fractions, as decimals or by rounding (e.g. 98 ÷ 4 = 24 r 2 = $24^{1}/_{2}$ = 24.5 ≈ 25).

Mental skills

- Recall multiplication and division facts for all numbers up to 12 x 12.
- Multiply and divide numbers mentally, drawing upon known facts.

Division

Year 5

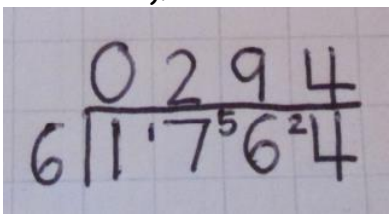
POS – Divide up to 4-digit numbers by a single digit including those with remainders.

Children should:

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)***

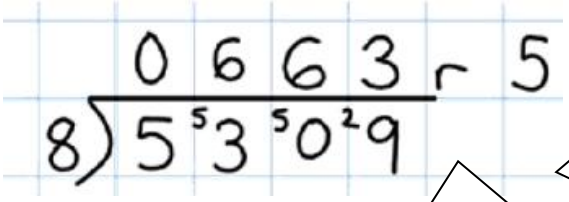
Emerging – Short division of 4-digit numbers by a single digit (with remainders occurring in the calculation).



End of year expectation

Short division of 4-digit numbers by a single digit (with remainders)

E.g. 5309 ÷ 8 =



Division with remainders needs to have a real life problem solving context, where pupils consider the meaning of the remainder and **how** to express it e.g. a fraction, a decimal or as a rounded number or value.

This could be expressed as 663 and five eighths, 663 r 5, as a decimal or rounded.