St Margaret Clitherow's Catholic Voluntary Primary Academy

Y3 Maths

Calculation Expectations

This booklet will explain how addition, subtraction, multiplication and division are taught in Year 3. There are two methods given; one for those children 'emerging' and the end of year expectation.

The 'emerging' method is for those children who are still developing their understanding of the four calculations. 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 3

Addition (+)

Emerging	End of year expectation
Expanded column method	Compact column method

Subtraction (-)

Emerging	End of year expectation
Expanded column method	Compact column method

Multiplication (x)

Emerging	End of year expectation
Empty number line	Grid method

Division (÷)

Emerging	End of year expectation
Empty number line	Short division

Addition

Year 3

Addition in Year 3

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, vertical, 'carry', expanded, compact***

Key skills for addition at Year 3

- Read and write numbers to 1000 in numerals and words.
- Estimate answers to calculations, using inverse to check answers.
- Solve problems, including missing number problems, using number facts, place value, and more complex addition.
- Recognise place value of each digit in 3-digit numbers (hundreds, tens, units.)
- Continue to practise a wide range of mental addition strategies, i.e. number bonds, adding the nearest multiple of 10, 100, 1000 and adjusting, using near doubles, partitioning and recombining.

Mental skills:

- Add 2-digit numbers mentally, including those exceeding 100.
- Add a three-digit number and units mentally (146 + 5)
- Add a three-digit number and tens mentally (146 + 50)
- Add a three-digit number and hundreds mentally (146 + 500)

Addition

Year 3

POS – Add numbers with up to 3-digits.

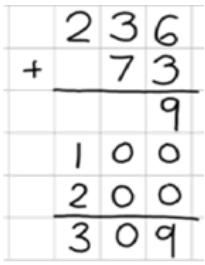
Children should have had lots of practise developing their mental fluency and accuracy.

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, vertical, 'carry', expanded, compact***

Notes: Please refer to the Y2 addition strategies if children do not have a secure understanding of place value.

Emerging – Add numbers with up to 3-digits using the **expanded column** method.



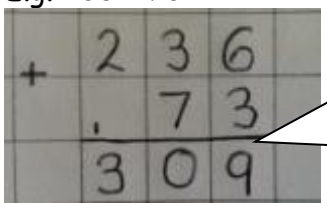
Steps to success:
-add the units
- add the tens
- add the hundreds
- find the total of h + t + u

Note: Children need to recognise the value of hundreds, tens and units without partitioning and be able to add in columns.

End of year expectation

Add numbers with up to 3-digits using the **compact column** method.

E.g. 236 + 73



Reinforce correct place value. The actual value is 30 + 70, not 3 + 7.

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

Compare the compact method to the expanded method to develop an understanding of the process and the reduced number of steps involved.

Subtraction

Year 3

Subtraction in Year 3

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,***

Key skills for subtraction at Year 3

- Estimate answers and use inverse operations to check.
- Solve problems, including missing number problems.
- Find 10 or 100 more or less than a given number.
- Recognise the place value of each digit in a 3-digit number.
- Counting up differences as a mental strategy when numbers are close together or near multiples of 10.
- Read and write numbers up to 1000 in numerals and words.

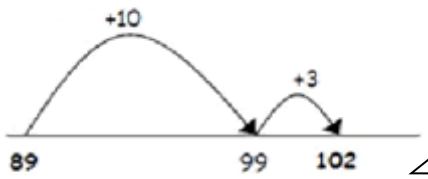
Mental skills

- Subtract mentally a: 3-digit number and ones, 3-digit number and tens, 3-digit number and hundreds.
- Practise mental subtraction strategies, such as subtracting near multiples of 10 and adjusting (e.g. subtracting 19 or 21), and select the most appropriate method to subtract, explaining why.

Mental strategies for subtraction

Counting on as a mental strategy for subtraction

Continue to reinforce **counting on** as a strategy for close-together numbers (e.g. 121 – 118) and also for numbers that are 'nearly' multiples of 10 (e.g. 102 – 89)



Steps for success
-start at the smallest number
-count on in tens first
-count on in units

Subtraction

Year 3

POS – Subtracting with 2 and 3-digit numbers.

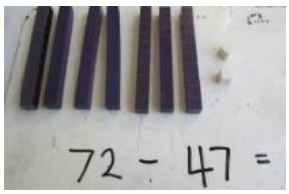
When learning to 'exchange', explore 'partitioning in different ways'. Children will begin to recognise that when you exchange the **value** is the same i.e. 72 = 70 + 2 = 60 + 12 = 50 + 22 etc.
Emphasise that the value hasn't changed; we have just partitioned it in a different way.

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,***

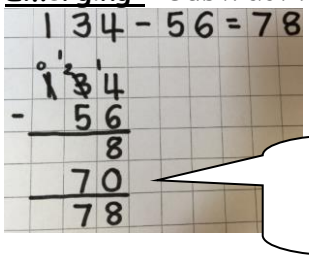
Notes:

Please refer to the Y2 addition strategies if children do not have a secure understanding of place value or children may use apparatus to support their understanding.

Step 1 : 

Step 2 'exchanging': 

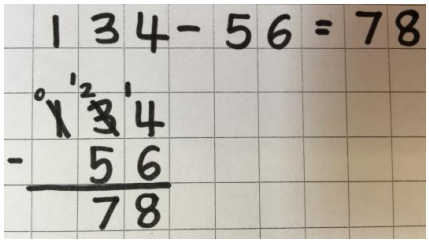
Emerging - Subtracting using the **expanded column method** and **'exchanging'**.



Reinforce place value
e.g. it's 120 – 50 not 12 - 5

Steps to success:
Subtract the units
If you can't, borrow a ten
Subtract the tens
If you can't, borrow a hundred
Subtract the hundreds
Find the total of the HTU

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



Steps to success:
Subtract the units
If you can't, borrow a ten
Subtract the tens
If you can't, borrow a hundred
Subtract the hundreds

Multiplication

Year 3

Multiplication in Year 3

Key Vocabulary

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

Key skills for multiplication at Year 3

- Write and calculate number statements using the multiplication tables they know, including **2-digit x single-digit**, drawing upon mental methods, and progressing to reliable written methods.
- Solve multiplication problems, including missing number problems.
- Use commutativity (6 x 5 = 5 x 6), the associative law (2 x 6 x 5 = 6 x 10 10 x 6) and other strategies (39 x 7 = 30 x 7 + 9 x 7) to help solve a range of problems, including missing number problems.
- Solve simple problems in contexts, deciding which operations and methods to use.

Mental skills

Recall and use multiplication facts for the **2, 3, 4, 5, 8 and 10** multiplication tables, and multiply multiples of 10.

Multiplication

Year 3

POS – Multiply a 2-digit number by a 1-digit number.

To understand the grid method, children must be able to:

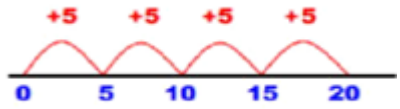
- Partition numbers into tens and units
- Multiply multiples of ten by a single digit (e.g. 20 x 4) using their knowledge of multiplication facts and place value
- Recall and work out multiplication facts in the **2, 3, 4, 5, 8 and 10** times tables.
- Work out multiplication facts not known by repeated addition or other taught mental strategies (e.g. by commutative law, working out near multiples and adjusting, using doubling etc.)

Key Vocabulary

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

Notes: If children need the concept of multiplication reinforced, please use repeated addition on an empty number line.

E.g. 4 x 5 =



Use the vocabulary "4 lots of 5".

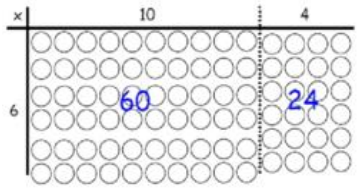
End of year expectation – Multiply 2-digits by a single number using the grid method.

E.g. 23 x 8 = 184

X	20	3
8	160	24

160 + 24 = 184

When introducing this concept, initially link this method to the array.



Division

Year 3

Division in Year 3

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***

Key skills for division at Year 3

- Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.
- Solve problems, in contexts, and including missing number problems, involving multiplication and division.
- Pupils develop efficient mental methods, for example, using multiplication and division facts (e.g. using 3 × 2 = 6, 6 ÷ 3 = 2 and 2 = 6 ÷ 3) to derive related facts (30 × 2 = 60, so 60 ÷ 3 = 20 and 20 = 60 ÷ 3).
- Pupils develop reliable written methods for division, starting with calculations of 2-digit numbers by 1-digit numbers and progressing to the formal written method of short division.

Mental skills

- Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 multiplication tables (through doubling, connect the 2, 4 and 8s).

Division

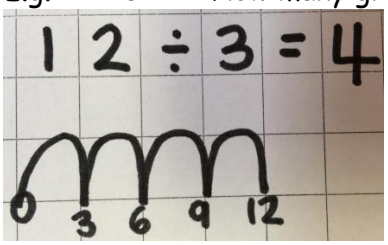
Year 3

POS – Divide 2-digit numbers by a 1-digit number (without remainders)

Notes:
Real life contexts need to be used routinely to help pupils gain a full understanding, and the ability to recognise the place of division and how to apply it to problems.

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***

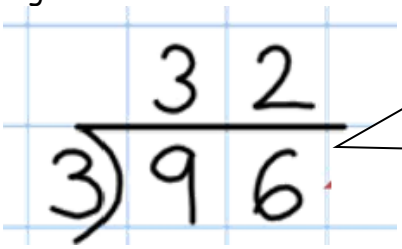
Emerging – grouping using an empty number line.
E.g. 12 ÷ 3 = "How many groups of 3 are in 12?"



Steps to success
Start on 0
Count on in the number you are dividing by
Count the hops

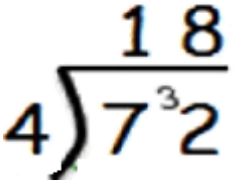
Expected – Short division (no remainders)
E.g. 96 ÷ 3 = 32

Only introduce this method once children are secure with division as grouping.



Remind children of correct place value, that 96 is equal to 90 + 6, but in short division pose:
How many 3s in 9? = 3, and record it above the 9 tens.
How many 3s in 6? = 2, and record it above the 6 units.

Short division (with numbers to be carried occurring in the calculation)
E.g. 72 ÷ 4 = 18



Children to carry on to the next digit.
If needed, they should use the number line to calculate individual division facts that occur which they are not yet able to recall mentally.