MELDRETH
Primary School

About our Calculation Policy

The following calculation policy has been devised to meet requirements of the National Curriculum 2014 for the teaching and learning of mathematics, and is also designed to give pupils a consistent and smooth progression of learning in calculations across the school. Please note that early learning in number and calculation in Reception follows the 'Development Matters' EYFS document, and this calculation policy is designed to build on progressively from the content and methods established in the Early Years Foundation Stage.

Age stage expectations

The calculation policy is organised according to age stage expectations as set out in the National Curriculum 2014. However it is vital that pupils are taught according to the stage that they are currently working at, being moved onto the next level when they are ready or working at a lower stage until they are secure enough to move on.

Providing a context for calculation

It is important that any type of calculation is given a real life context or problem solving approach to help build children's understanding of the purpose of calculation, and to help them recognise when to use certain operations and methods when faced with problems. This is a priority within calculation lessons.

Choosing a calculation method

Children need to be taught and encouraged to use the following processes in deciding what approach they will take to a calculation, to ensure they select the most appropriate method for the numbers involved...

Can I do it in my head?
Could I use some jottings to help me?
Should I use a written method to work it out?

Year 3 Add numbers with up to 3-digits

Introducing the expanded column addition method:

```
    2 3 6
  +   7 3
        9
    1 0 0
    2 0 0
    3 0 9
```

Key skills for addition at Y3:

In their head:

- Add 2-digit numbers mentally, incl. those exceeding 100.
- Add a three-digit number and ones mentally (175 + 8)
- Add a three-digit number and tens mentally (249 + 50)
- Add a three-digit number and hundreds mentally (381 + 400)
- Estimate answers to calculations, using inverse to check answers.
- Continue to practise a wide range of mental addition strategies, ie. number bonds, adding the nearest multiple of 10, 100, 100 and adjusting, using near doubles, partitioning and recombining.
- Recognise place value of each digit in 3-digit numbers (hundreds, tens, ones.)

On paper:

- Read and write numbers to 1000 in numerals and words.

- Solve problems, including missing number problems, using number facts, place value, and more complex addition.

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

Addition

Subtraction

Year 3 Subtracting with 2 and 3-digit numbers.

The partitioned column subtraction method.

$$89 - 35 = 54$$

$$
\begin{aligned}
80 &+ 9 \\
- \quad 30 &+ 5 \\
\hline
50 &+ 4
\end{aligned}
$$

Introduce "exchanging" through practical subtraction.

$$
\begin{aligned}
{}^{60}\cancel{70} &+ {}^{12}\cancel{2} \\
- \quad 40 &+ \ 7 \\
\hline
20 &+ \ 5 = 25
\end{aligned}
$$

Counting on as a mental strategy for subtraction

Continue to reinforce counting on as a strategy for close-together larger numbers (e.g. 321−256)
Start at the smaller number and count on in tens first, then count on in units to find the rest of the difference:

$321 - 256$

+4   +40   +21

256   260   300   321
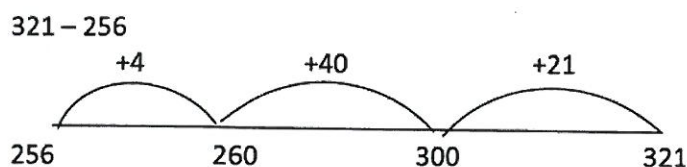
Add the 'hops': 40 + 21 + 4 = 65

Key skills for subtraction at Y3:

- Subtract mentally a: 3-digit number and ones, 3-digit number and tens, 3-digit number and hundreds
- 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.
- Read and write numbers up to 1000 in numerals and words.
- Practise mental subtraction strategies, such as subtracting near multiples of 10 and adjusting (e.g. subtracting 19 or 21), and select most appropriate methods to subtract, explaining why.

Key vocabulary: equal to, take, take away, less, minus, subtract, leaves, difference, distance between, how many more, how many fewer / less than, most, least, count back , how many left, how much less is_? count on, strategy, partition, tens, units exchange, decrease, hundreds, digit
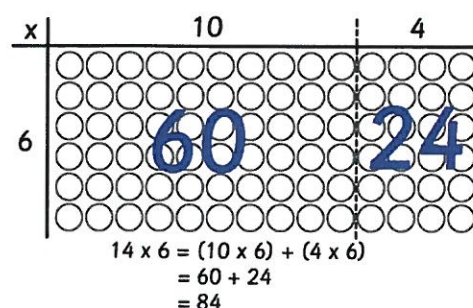
Multiplication

Year 3 Multiply 2-digits by a single digit number

The grid method for multiplying 2-digit by single-digits:

Eg.   23 x 8 = 184

X	20	3
8	160	24

$14 \times 6 = (10 \times 6) + (4 \times 6)$
$= 60 + 24$
$= 84$

Link the grid method to an array

Key skills for multiplication at Y3:

- Recall and use multiplication facts for the 2, 3, 4, 5, 9 and 10 multiplication tables, and multiply multiples of 10.
- 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.
- Develop mental strategies using commutativity (e.g. 4 x 12 x 5 = 4 x 5 x 12 = 20 x 12 = 240)
- Solve simple problems in contexts, deciding which operations and methods to use.
- Develop efficient mental methods to solve a range of problems e.g using commutativity (4 × 12 × 5 = 4 × 5 × 12 = 20 × 12 = 240) and for missing number problems _ x 5 = 20, 3 x _ = 18, _ x _ = 32

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..., inverse, partition, grid method, multiple, product, tens, units, value

Division

Year 3 Divide 2-digit numbers by a single digit (where there is no remainder in the final answer)

Grouping on a numberline $45 \div 9 = 5$
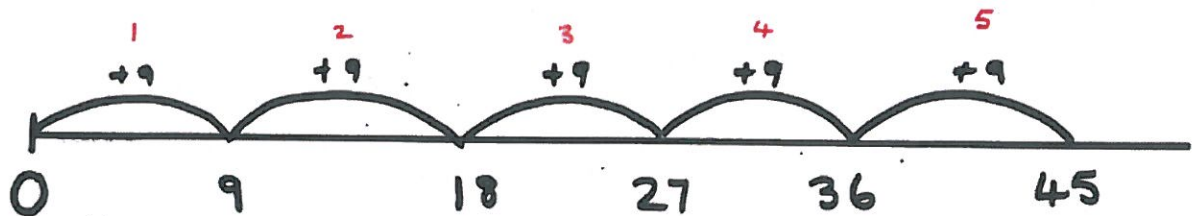
Key skills for division at Y3:

- 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).
- 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 $3 \times 2 = 6$, $6 \div 3 = 2$ and $2 = 6 \div 3$) to derive related facts ($30 \times 2 = 60$, so $60 \div 3 = 20$ and $20 = 60 \div 3$).
- 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.

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**