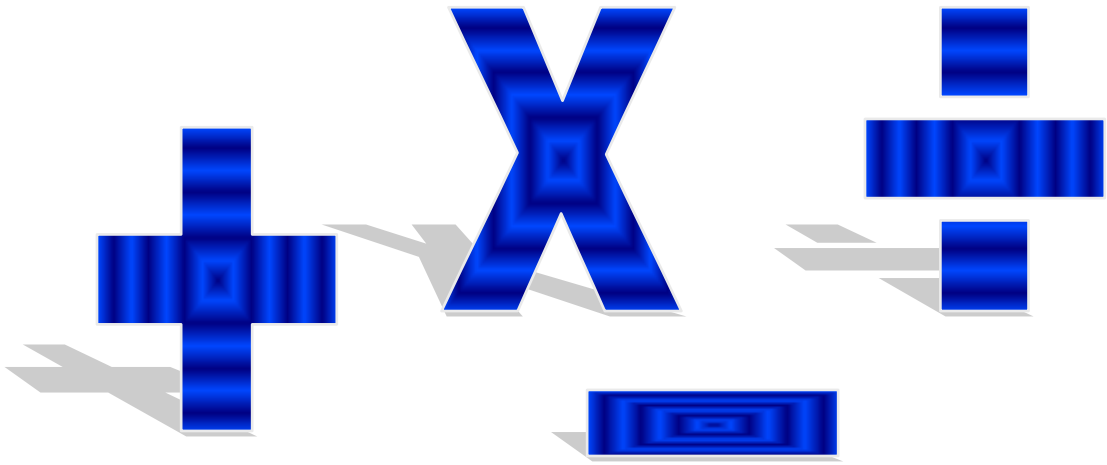
Childcare, education and community services for all

Bridgewater

Helping your child with calculations in year 3.



Calculation Policy for Parents.

This booklet has been designed as a guide for parents, to help them understand how the four operations (addition, subtraction, multiplication and division) are taught in our School.

The maths work your child is doing at school may look very different to the kind of 'sums' you remember. The teaching of maths is now about developing an understanding of number and not just knowing which kind of calculation to perform in a given situation. Initially children work through practical, oral and mental activities as children begin to understand these ideas they develop ways of recording to support their thinking. These informal methods become more efficient and succinct and lead to efficient written methods.

The calculation policy is organised according to age stage expectations as set out in the National Curriculum 2014, **however pupils will be taught according to the level that they are currently working at,** being moved onto the next level as soon as they are ready, or working at a lower stage until they are secure enough to move on. This means a pupil currently achieving below the average level is likely to be working at the level of year groups below, and vice versa for pupils working at above average levels. Please feel welcome to come and ask your child's class teacher to clarify with you the stages / methods your child is working on if you are unsure.

If your child gets 'stuck' on a particular stage it is always worth revisiting the previous stage or stages to review their understanding.

When faced with a calculation problem, encourage your child to ask…

1. Can I do this in my head?

2. Could I do this in my head using drawings or jottings to help?

3. Do I need to use a written method?

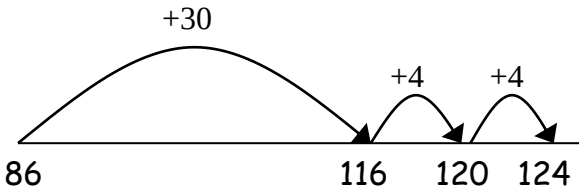
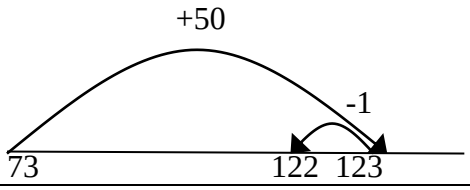
4. Do I need to use a calculator?

Also help your child to estimate and then check their answer. Encourage them to ask…

Is the answer sensible?

Addition – add with up to 3 digit numbers

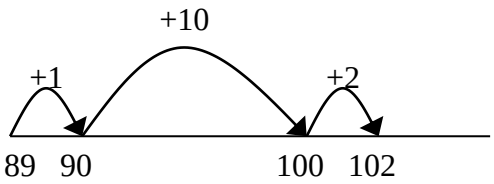
Children are taught to understand addition as combining two sets or more and counting on.

38 + 86 = 124  	Children will continue to use empty number lines with increasingly large numbers, including compensation where appropriate. Count on from the largest number irrespective of the order of the calculation
49 + 73 = 122  	Rounding and adjusting
34 + 23 = 57 30 + 4 20 + 3 50 + 7 = 57	Children will move onto columnar addition. They will initially be supported in this by using practical equipment
6 7 + 2 4 80 (60 +20) 1 1 (7 +4) 9 1 6 7 + 2 4 1 1 (7 +4) 80 (60 +20) 9 1	Children will start to add the most significant numbers first, which is how we solve the calculations in our head. The children will quickly move on to adding the least significant digit first.

$\begin{array}{rrrr} & 2 & 6 & 7 \\ + & 1 & 2 & 4 \\ \hline & 3 & 9 & 1 \\ \hline & & 1 & \end{array}$	When the children show a good understanding of number they will move on to the compact column method with carrying. The carried over number is written below the line.
Key number skills Read and write numbers to 1000 in numerals and words. 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. Recognise place value of digits in 3-digit numbers (hundreds, tens, units)	**Key vocabulary** add, more, plus, and, make, altogether, total, equal to, equals, double, most, count on, number line, sum, tens, ones, partition, addition, column ,tens boundary hundreds boundary, increase, vertical, 'carry', expanded, compact

Subtraction – subtract with 2 and 3 digit numbers

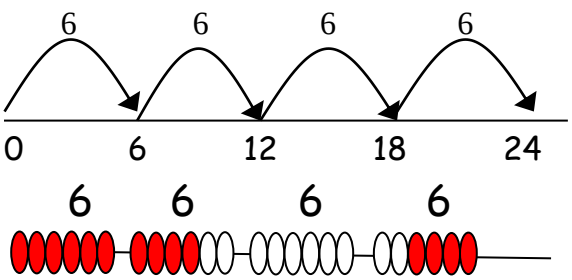
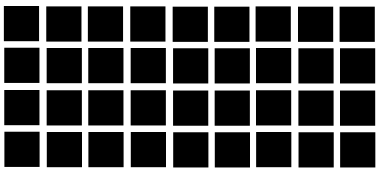
Children are taught to understand subtraction as taking away (counting back) and finding the difference (counting up).

	Children will continue to use the empty numberline with increasingly larger numbers
102 – 89 = 13  	**Counting on**. If the numbers in a calculation are close together or near to a multiple of 10, 100 etc. children can use the counting on method. Starting from the smallest number and counting up to the largest number. Finding out how many are in between.
80 + 9 - 50 + 7 30 + 2	Children will use **partitioning**. They will use place value cards and hundreds, tens and units practical apparatus to help them see the numbers. Children will not exchange at first.
8 9 - 5 7 3 2	This leads to **decomposition**. Children will not need to exchange at first.
74 – 27 = 70 + 4 - 20 + 7 60 14 ~~70~~ + 4 - 20 + 7 40 + 7	This will lead to exchanging whilst set out in columns.

Key number skills	Key vocabulary
Subtract mentally: A 3-digit number and ones; a 3-digit number and tens; a 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 .	equal to, take, take away, less, minus, subtract, leaves, distance 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

Multiplication – multiply 2 digit numbers by a single digit

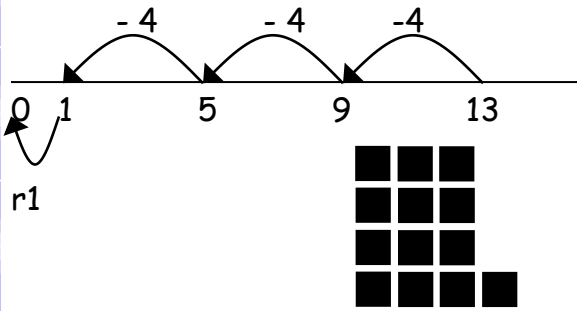
Children are taught to understand multiplication as repeated addition and scaling. It can also describe an array.

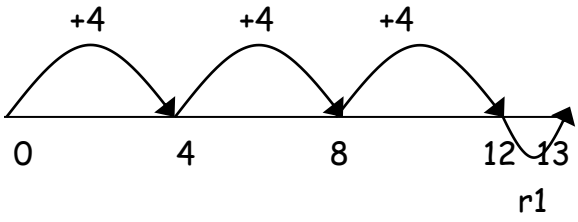
4 times 6 6 + 6 + 6 + 6 = 24 4 lots of 6 6 x 4	Children may continue with repeated addition .
	Any empty number line can be used to help with repeated addition. A bead string can also be used.
 **4 x 9 = 36** **9 x 4 = 36**	Arrays are still useful.
38 x 5 = (30 x 5) + (8 x 5) = 150 + 40 = 190	Children will multiply larger numbers using their times tables knowledge and **partitioning** the numbers.
x 30 8 5 150 40 = 190	This will lead onto the children using the **grid method** for multiplication.

Key skills	Key vocabulary
Recall and use multiplication facts for the 2, 3, 4, 5, 8 and 10 multiplication tables, and multiply multiples of ten. Write and calculate number statements using the multiplication tables they know, incl. **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)	groups of, lots of, times, array, altogether, multiply, total, count up in, multiplied by, column, row, repeated addition, commutative, sets of, equal groups, _ times as big as, once, twice, three times etc. partition, grid method, multiple, product, tens, units, value

Division - Divide 2-digit numbers by a single digit (no remainders in the final answer)

Children are taught to understand division as repeated subtraction, sharing and grouping.

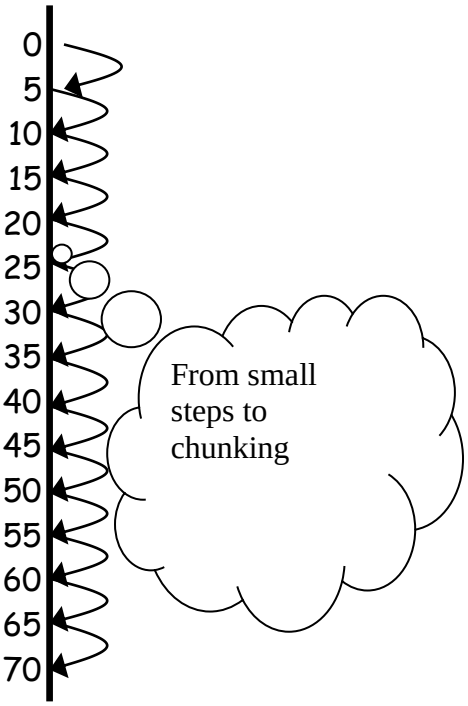
Key skills	**Key vocabulary**
*Recall and use multiplication/ division facts for 2, 3, 4, 5, 8, 10 multiplication tables (through doubling, connect the 2, 4 and 8s). *Write and calculate number statements for multiplication and division using multiplication tables that they know, including for 2-digit numbers times 1-digit numbers. *Solve problems, in contexts, and including missing number problems, involving multiplication and division. *Develop efficient mental methods, e.g. 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).	share, share equally, one each, two each…, group, groups of, lots of, array, divide, divided by, divided into, division, grouping, number line, left, left over inverse, short division, 'carry', remainder, multiple
12 ÷ 3 = 4 	Division can be done by repeated subtraction along a numberline. How many times can I take 3 away from 12?
13 ÷ 4 = 3 r 1 	Children will move onto calculations that have a remainder.

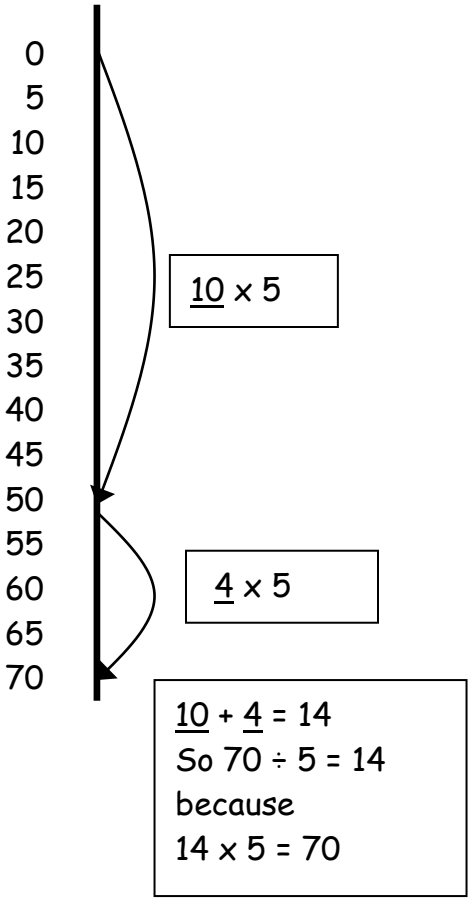


$13 \div 4 = 3$ r 1

As children become confident with their times tables they may prefer to count on.

Children will use this counting on to lead towards a method called **chunking**.





$$
\begin{array}{r}
\ 2\ 4 \\
3\overline{)}\ 7\ 2 \\
-\ 3\ 0 \quad (10 \times 3) \\
\hline
\ 4\ 2 \\
-\ 3\ 0 \quad (10 \times 3) \\
\hline
\ 1\ 2 \quad (4 \times 3)
\end{array}
$$

This leads to a vertical recording of chunking.

Top tip: Children to subtract chunks they are most comfortable with

Work out 2x

5x

10x

72 ÷ 3 $\begin{array}{r} 24 \\ 3\overline{)\,7^{1}2} \end{array}$	This will lead to short division but only when the children have a good understanding of the numbers. E.g. how many 3's are in 70. A link to multiplication would be beneficial here.