Calculation Policy at Cam Woodfield Junior School

Intent

At Cam Woodfield Junior School, we recognise that instilling an appreciation of number and number operations is key to children being successful mathematics. This enthusiasm and appreciation enables children to efficiently, accurately and fluently perform mental calculations and written procedures.

Our Maths curriculum is designed with an emphasis on a mastery approach so that all children can:

- Recall accurately and quickly basic number facts (e.g. number bonds, multiplication and division facts)
- To build links
- Become fluent in applying efficient written and mental methods of calculation
- To apply their understanding of calculation to reason mathematically and solve problems

(National Curriculum 2014)

Implementation

- At Cam Woodfield Junior School, our Mathematics curriculum focuses on developing conceptual understanding of calculation methods and learning facts in our Maths lessons (intelligent practice sessions).
- As a school, we also have daily deliberate practice sessions (Maths Meetings) where the children revisit number facts and efficient methods for calculations from previous year groups, as well as their current year group.
- We use Can Do Maths, which provides all teachers with a scheme that helps develop a secure and deep understanding of calculation strategies that helps to embed a mastery approach to teaching efficient written and mental calculation methods.
- All teachers use concrete and pictorial representations to teach conceptual understanding of mental and written calculation methods, modelling the most effective resources to use for each calculation method.

- Before doing a calculation, all teachers and pupils look at a calculation and think 'What do I notice? 'and 'Can I do it in my head, with jottings or do I need to use a written method? '
- At Cam Woodfield Junior School, we also follow a whole school progressive scheme to teaching times tables, where children work to achieve an award by learning and recalling a times table and the corresponding division facts up to 12 x 12, at speed.
- Within times table sessions, they learn strategies, top tips, games and patterns to help them to learn the times table. The scheme also encourages the children to revisit times tables that they have already achieved to help them to be secure in their understanding of all times tables.
- As a school, we also teach the 21 facts for timestables, where the children focus on one of the facts each day and record what they know using the three numbers linked to the fact.
- Children apply their understanding of written and mental calculations to weekly 10 in 10 arithmetic tests.

Impact

- All teachers are confident and skilled to teach mental methods (in your head or with jottings) and written calculation methods
- All children have a secure understanding of mental and written methods of calculation suitable for their stage of learning.
- All children choose appropriate calculation methods depending on the numbers.
- All children can recall, understand and make connections using facts suitable for their stage of learning.
- All children apply their understanding of written and mental calculation strategies to solve problems and reason mathematically.
- All children have a richer vocabulary that relate to the four calculation methods, to help them to confidently identify the calculation strategies they need to use.
- All children have an appreciation and enthusiasm to persevere when learning a new calculation method as they understand that they 'can do it!'

Cam Woodfield Junior School's Whole School Written and Mental Calculations Progression Document

(Linked to Can Do Maths Scheme)

Addition and Subtraction					
Y1	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9	Add and subtract two two-digit numbers using concrete objects, pictorial representations progressing to formal written methods Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers adding three one-digit numbers	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction Add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens a three-digit number and hundreds	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition where appropriate signs Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Add and subtract numbers mentally with increasingly large numbers	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why Perform mental calculations, including with mixed operations and large numbers

Multiplication and Division					
Y1	Y2	Y3	Y4	Y5	Y6
Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	Write and calculate mathematical statements for ÷ using the × tables they know progressing to formal written methods. 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 methods Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers Recognise and use factor pairs and commutativity in mental calculations	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout	Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers 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 Multiply and divide numbers mentally drawing upon known facts Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication Divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context 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 Perform mental calculations, including with mixed operations and large numbers

Number Facts					
Y1	Y2	Y3	Y4	Y5	Y6
Represent & use number bonds and related subtraction facts within 20 Add and subtract one-digit and two-digit numbers to 20, including zero	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Recall and use x and ÷ facts for the 2, 5 and 10 x tables, including recognising odd and even numbers.	Recall and use x and ÷ facts for the 3, 4 and 8 times tables.	Recall x and ÷ facts for x tables up to 12 x 12.	Recall prime numbers up to 19 Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers Recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	Recall x and ÷ facts for x tables up to 12 x 12 and use to find other related facts

Cam Woodfield Junior's Calculation Written Methods

Addition

23454 + 596= 24050

$$\begin{array}{r} 23454 \\ +\quad 596 \\ \hline 24050 \\ \scriptstyle 1\ 1\ 1 \end{array}$$

48.56 + 23.7 = 72.26

$$\begin{array}{r} 48.56 \\ +\ 23.70 \\ \hline 72.26 \\ \scriptstyle 1\ 1 \end{array}$$

Subtraction

2748 – 364 = 2384

$$\begin{array}{r} {\scriptstyle 6\ 1} \\ 2748 \\ -\ 364 \\ \hline 2384 \end{array}$$

72.5 – 45.73 = 26.77

$$\begin{array}{r} {\scriptstyle 6\ 1\ 1\ 4\ 1} \\ 72.50 \\ -\ 45.73 \\ \hline 26.77 \end{array}$$

Multiplication

5172 x 38 = 196536

$$\begin{array}{r} 5172 \\ \times\ 38 \\ \hline 41376 \\ +\ 155160 \\ \hline 196536 \\ \scriptstyle 1 \end{array}$$

Long Multiplication method

Division

258 ÷ 3 = 86

$$\begin{array}{r} 086 \\ 3\overline{)\,258} \end{array}$$

Short Division method

562 ÷ 13

$$\begin{array}{r} 043.23 \\ 13\overline{)\,562.3040} \end{array}$$

Using known multiplication facts

1	13
2	26
4	52
5	65
8	104
10	130

= 43 r 2

= 43 $\frac{2}{13}$

= 43.2 (1dp)