

Village Infants School



MENTAL MATHEMATICS POLICY

This policy should be read alongside the Mathematics Policy and Maths Written and Manipulatives Policy. This policy contains the key knowledge and skills pupils need to calculate mentally. It has been written to ensure consistency and progression throughout the school. It is important to recognise that the ability to calculate mentally lies at the heart of numeracy. November 2015.

Document Adopted By Governing Body	
Date:	
Signed (Chair):	
Date:	
Print Name:	
Date of Next Review:	

MENTAL MATHEMATICS POLICY

Aims

- To ensure a consistent and progressive approach exists within the school to secure good to outstanding progress in mental calculation.
- To ensure that mental calculation is an integral part of numeracy lessons.
- For pupils to use written recordings/jottings to clarify their thinking and support/extend the development of more fluent and sophisticated mental strategies.
- Although mental calculation skills will be taught in the year group specified, pupils should not be discouraged from using previously taught methods with which they are secure, while the new concepts are becoming embedded. In addition if pupils are secure in certain forms of mental calculation, differentiation should provide pupils the opportunity to progress to a more sophisticated form.
- For pupils to reflect upon which method to use to solve a problem and ask questions such as 'Do I need to use a written method or can I do this in my head?' □□'Is my answer sensible?'
- For pupils to be able to clearly explain the mental calculation and justify why their answers are correct using sound mathematical vocabulary. Strong speaking and listening opportunities underpin good mathematics teaching.
- To share progress mental calculation with parents so that they have the confidence and knowledge to support their pupils at home with their mathematical development
- For pupils to use their mental skills to check the steps involved in a written calculation and decide if their answer makes sense.

The objectives for Mental Calculation have been adapted from those provided by Chartwell Primary Maths following a course attended on Mastery in November 2015.

Early Years end of Key Stage Mental Calculations expectations

Rapid Recall and Counting	Pupils should be able to use the following Mental Strategies , as appropriate for mental calculations
<ul style="list-style-type: none">• Count reliable 1-20• Order numbers 1-20 (your child being able to order the numbers 1-20 confidently by counting fluently)	<ul style="list-style-type: none">• One more (of numbers 1-20)• One Less (of numbers 1-20)• Begin to add or subtract a single digit to or from a single digit with out crossing 10 i.e. $4 + 5$, $8 - 3$• Begin to add or subtract a single digit to or from 10• Begin to know some doubles• Begin to know some halves

Year 1 end of year Mental Calculations expectations

Rapid Recall and Counting	Pupils should be able to use the following Mental Strategies , as appropriate for mental calculations	Pupils should be able to Calculate Mentally
<ul style="list-style-type: none"> • Count from 1 and from any other number forwards and backwards in 1's 2's 5's 10's • Distinguish between ordinal and cardinal numbers • Count in $\frac{1}{2}$ to ten. • Know by heart all number bonds to 10. • Know by heart all addition and subtraction facts for numbers up to 10 in 3 forms $6+2 = 8$, $2 + 6 = 8$, $8 - 2 = 6$, • Recall doubles of all numbers to at least twenty and corresponding halves • Begin to recognise two-digit multiples of 2,5,10 • Know odd and even numbers 	<ul style="list-style-type: none"> • Re-order numbers in a calculation e.g. $2 + 8$ to $8 + 2$ noticing that this does not Change the answer • Begin to bridge through 10, and later 20, when adding a single digit number • Use known number facts and place value to add or subtract pairs of single-digit numbers • Add 9 to single-digit numbers by adding 10 and then subtracting 1 • Identifying near doubles, using doubles already known i.e. $8 + 7$ is $7 + 7 + 1$, or $8 + 8 - 1$ • Use patterns of similar calculations i.e. $9 + 1 = 10$, $9 + 2 = 11$, $9 + 3 = 12$ • Begin to partition to add numbers close to a multiple of 10 e.g. $5 + 9 = 5 + 10 - 1$ (using a number line) • Bridging through numbers other than 10, e.g. 1 week = 7 days 'It is half past seven. What time was it 3 hours ago?' 	<ul style="list-style-type: none"> • Add or subtract a single digit to or from a single digit with out crossing 10 i.e. $4 + 5$, $8 - 3$ • Add or subtract a single digit to or from 10 • Add or subtract a single-digit to or from a 'teens' number, without crossing 20 or 10, e.g. $13 + 5$, $17 - 3$ • Doubles of all numbers to 20, e.g. $7 + 7$, double 9 • Add or subtract 10 to any 2 digit number i.e. $32 + 10 = 42$, recognising patterns and the digit that changes

Year 2 end of year Mental Calculations expectations

Rapid Recall and Counting	Pupils should be able to use the following Mental Strategies , as appropriate for mental calculation.	Pupils should be able to Calculate Mentally
<ul style="list-style-type: none"> Count in forward steps of 2,3,5 and 10 from any given number Count in backward steps in 2, 5 and 10 from any given number. Count in fractions up to 10, using $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{1}{3}$. Know by heart all number bonds that total 20 Know by heart all addition and subtraction facts for each number up to 20 Know by heart doubles of all number to 20 Know by heart all halves of numbers to 20 Know by heart all multiplication facts for 2, 5 and 10 tables Know division facts for multiples of 2,5,10 Know by heart all bonds of multiples of 10 up to 100 e.g. $30 + 70$. Begin to recall and use addition and subtraction facts up to 100. 	<ul style="list-style-type: none"> Find 10 more and less than numbers to 100 Find a difference by calculating from the smaller to the larger number. Reorder numbers in a calculation. E.g. $2 + 36 = 36 + 2$, $5 + 7 + 5 = 5 + 5 + 7$ Add three small numbers by putting the largest number first and/or finding a pair totalling 10. i.e. $2 + 6 + 9$ becomes $9 + 6 + 2$ $8 + 3 + 2$ becomes $(8 + 2) + 3 =$ Respond to questions such as 'Tell me three numbers that add to 20?' Work out $1 + \square + 5 = 17$ Bridging through numbers other than 10. e.g. 1 year = 12 months. 10.30 to 10.45 Partition additions into 10s and units and then recombine mentally with 2 digit numbers that total less than 100 i.e. $24 + 12 =$ $20 + 10 + 4 + 2 =$ $30 + 6 = 36$ Partitioning bridging through multiples of 10 $6 + 7 = 6 + 4 + 3$ $23 - 9 = 23 - 3 - 6$ Use known number facts and place value to add or subtract pairs of numbers 	<ul style="list-style-type: none"> Add or subtract a single-digit to or from any two-digit with out crossing the tens boundary e.g. $62 + 4$, $38 - 7$ Add or subtract a single-digit to or from 10 e.g. $60 + 5$, $80 - 7$ Add or subtract any teens number to any two-digit number, without crossing the tens boundary e.g. $24 + 14$, $48 - 13$ Find what must be added to any two-digit multiple of 10 to make 100 e.g. $70 + \square = 100$ Add or subtract a multiple of 10 to or from any two-digit number when the difference is less than 10 e.g. $78 - 71$ or $52 - 48$ Doubles of all numbers to at least 20. Double any multiple of 5 up to at least 50 e.g. double 35. Halve any multiple of 10 up to 100 e.g. halve 50 Mental addition and subtraction of two digit numbers, totalling less than 100, where a tens barrier is not crossed

- Understanding place value to multiply and divide by 10, moving digits to right to multiply by 10 and to the left to divide by 10
i.e. $17 \times 10 = 170$, $30 \div 10 = 3$.
- Add or subtract 9, 19, 11 or 21 by rounding and compensating. i.e. $37 + 9 = 37 + 10 - 1 = 46$
- Using near doubles e.g. $13 + 14$ is double 14 and subtract 1 or double 13 and add 1. understanding halving as the inverse of doubling
- Use the relationship between addition and subtraction i.e. $8 + 7 = 15$ therefore $15 - 8 = 7$ and $15 - 7 = 8$
- Use knowledge of number facts and place value to multiply and divide by 2, 5, and 10
- Uses patterns of similar calculations.
e.g. $12 + 7 = 19$, $120 + 70 = 190$