HAMBLETON CE PRIMARY SCHOOL

Mental Maths Policy

Introduction

Our definition of Mental calculation

'Rapid recall of number is one aspect but there are others. This involves presenting children with calculations in which they have to work out the answer suing known facts and not just recall it from a bank of number facts that are committed to memory. Children should understand and be able to use the relationship between the four operations and be able to construct equivalent calculations that help them to carry out such calculations.'

(From Teaching Children to calculate Mentally – National Strategies 2010)

We believe that Mental Maths should…

- Be wider than just mental calculating
- Happen every day
- Give children a wide, frequent, planned variety of opportunities to develop their mental maths skills
- Include reasoning, problem solving and communicating

The Foundation Stage Curriculum uses the Early Learning Goals. From Y1 to Y6 statutory requirements of the National Curriculum in Mathematics will be met by fully implementing the National Curriculum objectives through the use of the White Rose Maths Hub Mastery planning documents.

The policy is intended to be read in conjunction with the calculation policy which illustrates strategies and methods outlined in the national curriculum and that are taught from Reception to year 6. It is also important to read the Foundation Curriculum Framework which highlights the Early Learning Goals and the guide of progression in the Reception year.

Aims

Our aim is to develop the 'number sense' in our children by a consistent daily session, encompassing a progression of skills and achieving high pupil engagement.

The school will offer a caring, supportive environment to enable the children to reach their potential as mathematicians from the educational provision available. In order to achieve this, our aims as teachers are:

- to encourage an enthusiastic and inquisitive attitude to mathematics
- to foster high standards of achievement in mathematics
- to develop pupils' numeracy and mathematical fluency, reasoning and problem solving in all subjects so that they understand and appreciate the importance of mathematics.

- to teach children to apply arithmetic fluently to problems, understand and use measures, make estimates and sense check their work.
- to enable children to apply their geometric and algebraic understanding.
- to help children understand the cycle of collecting, presenting and analysing data.
- to teach children to apply their mathematics to both routine and nonroutine problems, including breaking down more complex problems into a series of simpler steps.
- to equip children with strategies to enable them to apply mathematics to real and unfamiliar situations within and beyond the classroom
- to develop an appreciation of the intrinsic value and fascination of mathematics as well as its usefulness in life
- to be fluent mentally at basic 4 operation number sentences

Thus, children will be able:

- to develop a positive and confident attitude to mathematics
- to make an active contribution to their own learning, by developing the skills of independence and enquiry
- to become confident and competent working with mathematics
- to develop an understanding of the ways in which information is gathered and presented
- to become thinkers and problem solvers
- to develop a clear understanding of the language of mathematics
- to develop logical thinking and reasoning, enabling them to record work clearly and in a variety of ways
- to develop the skills, knowledge and understanding needed in daily life

When children leave Hambleton CE Primary School they:

- Have a secure knowledge of number facts and a good understanding of the four operations;
- Are able to use this knowledge and understanding to carry out calculations mentally and to apply general strategies;
- Make use of diagrams, informal notes etc to help record steps and part answers when using mental methods that generate more information than can be kept in their heads;

Structure, continuity and Progression

A progression document is used, outlining the key skills for each year group across each term. A 'child friendly' overview of the main core skills are evidences in the classroom upon the learning wall. The key skill/skills being targeted at present by each class is outlined on the Maths learning wall. Children will develop new techniques and maintain existing skills effectively.

Our school Calculation policy provides a structured and systematic approach to teaching calculation skills. There is a high emphasis on developing a secure base of mental skills.

Teaching and Learning of Mental Calculations

Mental Maths is taught daily at a time deemed appropriate by the class teacher, where new techniques are taught and existing techniques rehearsed. This will involve the practice of quick recall number facts, the solving of problems and discussion of effective strategies for carrying out mental operations. Mental Maths is also integrated into everyday Maths lessons. Mental Calculation strategies are developed using a variety of approaches (concrete, pictorial, abstract), including the use of equipment. The class Maths learning wall is used to highlight areas of teaching/learning

Assessments of Mental calculation

We assess by using ongoing day-to-day assessment and periodic stepping back assessment. The assessments will inform the future planning. The Year 4 children take part in the Times Table test.

Monitoring and Evaluating Mental Calculations

Mental Maths is monitored within the monitoring and evaluation of Mathematics.

The school takes part in Mathematic Competitions/events;

- It's a knockout (within class)
- Class rock star competitions/Battle of the Bands (between classes)
- Regional/national Sumdog events

Homework and the role of parents

Mental Maths homework is given to the pupils when required and may include:

- Times table rocks star practice
- Sumdog key sessions
- Times tables books to be completed

Counting/ Using Number	**30-50** ~ Uses some number names accurately in play. ~ Recites numbers in order to 10. ~ Knows that numbers identify how many objects are in a set. ~ Shows an interest in numerals in the environment. ~ Realises not only objects, but anything can be counted, including steps, claps or jumps. **40 – 60** ~ Counts up to three or four objects by saying one number name for each item. ~ Counts actions or objects which cannot be moved. ~ Counts objects to 10, and beginning to count beyond 10. ~ Counts out up to six objects from a larger group. ~ Counts an irregular arrangement of up to ten objects. ~ Estimates how many objects they can see and checks by counting them. ~ Says the number that is one more than a given number.
Number Recognition	**30 - 50** ~ Uses some number names and number language spontaneously. ~ Sometimes matches numeral and quantity correctly. **40 – 60** ~ Recognise some numerals of personal significance. ~ Recognises numerals 1 to 5. ~ Selects the correct numeral to represent 1 to 5, then 1 to 10 objects.
Applying Knowledge to mathematical problems	**30 - 50** ~ Beginning to represent numbers using fingers, marks on paper or pictures. ~ Shows curiosity about numbers by offering comments or asking questions. ~ Compares two groups of objects, saying when they have the same number. ~ Shows an interest in number problems. ~ Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same ~ Shows an interest in representing numbers. **40 - 60** ~ Uses the language of 'more' and 'fewer' to compare two sets of objects. ~ Finds the total number of items in two groups by counting all of them. ~ Finds one more or one less from a group of up to five objects, then ten objects. ~ In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.

	~ Records, using marks that they can interpret and explain. ~ Begins to identify own mathematical problems based on own interests and fascinations. Early Learning Goal Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

Year 1

Rapid Recall	~ All pairs of numbers with a total to 10 e.g. 3+7 ~ Addition and subtraction facts for all numbers to any number to 10. ~ Addition doubles of all numbers to at least 10+10 ~ Halving facts of even numbers to 20. ~ One and two more/ less than any number up to 100. ~ 10 more/less of multiples of 10 ~ 5 more/ less of multiples of 5
Mental Strategies **Children should be able to use the following strategies, as appropriate, for mental calculations:**	~ Count on or back in ones, twos, fives and tens ~ Reorder numbers in calculation ~ 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 then subtracting 1 ~ Subtract 9 by subtracting 10 then adding 1 ~ Identify near doubles using doubles already know ~ Use patterns of similar calculations
Mental Calculations **Children should be able to calculate mentally:**	~ Add or subtract a single digit to or from a single digit, without crossing 10 e.g. 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 ~ Double of all numbers to 10 e.g. 8+8, double 6

Year 2

Year 3

Rapid Recall	~ addition and subtraction facts for each number to 20, e.g. 13 + 4 ~ sums and differences of multiples of 10, e.g. 70 + 20 or 80 – 30 ~ number pairs that total 100, e.g. 46 + 54 ~ multiplication facts for the 2, 3, 4, 5, 6 and 10 times tables and the corresponding division facts

Rapid Recall	~ Addition and subtraction facts for all numbers to at least 10 ~ All pairs of numbers with a total of 20 e.g. 13 +7 ~ All pairs of multiples of 10 with a total of 100 e.g. 30+70 ~ Multiplication facts for the 2 and 10 times tables and corresponding division facts ~ Double of all numbers to ten and the corresponding halves ~ Multiplication facts up to 5x5 e.g. 4x3 ~ Know 10x, 2x, 5x tables ~ Count forwards and backwards in 3's to 36 ~ Know inverse ÷ for 10, 2 and 5
Mental Strategies **Children should be able to use the following strategies, as appropriate, for mental calculations:**	~ count on or back in tens or ones ~ find a small difference by counting up from the smaller to the larger number ~ reorder numbers in a calculation ~ add three small numbers by putting the largest number first and/or finding a pair totalling 10 ~ partition additions into tens and units then recombine ~ bridge through 10 or 20 ~ use known number facts and place value to add or subtract pairs of numbers ~ partition into '5 and a bit' when adding 6, 7, 8 or 9 ~ add or subtract 9, 19, 11 or 21 by rounding and compensating ~ identify near doubles ~ use patterns of similar calculations ~ use the relationship between addition/subtraction ~ use knowledge of number facts and place value to multiply or divide by 2, 5 or 10 ~ use doubles and halves and halving as the inverse of doubling
Mental Calculations **Children should be able to calculate mentally:**	~ add or subtract any single-digit to or from any two-digit number, without crossing the tens boundary, e.g. 62 + 4, 38 – 7 ~ add or subtract any single-digit to or from a multiple of 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. 23 + 14, 48 – 13 ~ find what must be added to any two-digit multiple of 10 to make 100, e.g. 70 + ? = 100 ~ add or subtract a multiple of 10 to or from any two-digit number, without crossing 100, e.g. 47 + 30, 82 – 50 ~ subtract any two-digit number 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 15, e.g. double 14 ~ double any multiple of 5 up to 50, e.g. double 35 ~ halve any multiple of 10 up to 100, e.g. halve 50

Mental Strategies Children should be able to use the following strategies, as appropriate, for mental calculations:	~ count on or back in tens or ones ~ find a small difference by counting up from the smaller to the larger number ~ reorder numbers in a calculation ~ add three or four small numbers by putting the largest number first and/or by finding pairs totalling 9, 10 or 11 ~ partition into tens and units then recombine ~ bridge through a multiple of 10, then adjust ~ use knowledge of number facts and place value to add or subtract pairs of numbers ~ partition into '5 and a bit' when adding 6, 7, 8 or 9 ~ add or subtract mentally a 'near multiple of 10' to or from a two-digit number ~ identify near doubles ~ use patterns of similar calculations ~ say or write a subtraction statement corresponding to a given addition statement ~ to multiply a number by 10/100, shift its digits one/two places to the left ~ use knowledge of number facts and place value to multiply or divide by 2, 5 or 10, 100 ~ use doubling or halving ~ say or write a division statement corresponding to a given multiplication statement
Mental Calculations Children should be able to calculate mentally:	~ find what must be added to any multiple of 100 to make 1000, e.g. 300 + ? = 1000 ~ add or subtract any pair of two-digit numbers, without crossing a tens boundary or 100, e.g. 33 + 45, 87 – 2 ~ add or subtract any single-digit to any two-digit number, including crossing the tens boundary, e.g. 67 + 5, 82 – 7 ~ find what must be added to/subtracted from any two-digit number to make the next higher/lower multiple of 10. e.g. 64 + ? = 70, 56 - ? = 50 ~ subtract any three-digit number from any three-digit number when the difference is less than 10, e.g. 458 – 451, or 603 – 597 ~ find what must be added to/subtracted from any three-digit number to make the next higher/lower multiple of 10, e.g. 647 + ? = 650, 246 - ? = 240 ~ double any number to *at least* 20, e.g. double 18, and corresponding halves, e.g. halve 36; double 60, halve 120; double 35, halve 70; double 450, halve 900 ~ multiply single-digit numbers by 10 or 100, e.g. 6 x 100 ~ divide any multiple of 10 by 10, e.g. 60 ÷ 10, and any multiple of 100 by 100, e.g. 700 ÷ 100

Year 4

Rapid Recall	~ Multiplication facts of the 2,3,4,5, 6, 7, 8, 9, 10, 11 and 12 times tables ~ Division facts corresponding to tables of 2,3,4,5, 6, 7, 8, 9, 10,11 and 12

Mental Strategies **Children should be able to use the following strategies, as appropriate, for mental calculations:**	~ count on or back in repeated steps of 1, 10 and 100 ~ count up through the next multiple of 10, 100 or 1000 ~ reorder numbers in a calculation ~ add 3 or 4 small numbers, finding pairs totalling 10 ~ add three two-digit multiples of 10 ~ partition into tens and units, adding the tens first ~ bridge through 100 ~ use knowledge of number facts and place value to add or subtract any pair of two-digit numbers ~ add or subtract 9, 19, 29, 11, 21 or 31 by rounding and compensating ~ add or subtract the nearest multiple of 10 then adjust ~ identify near doubles ~ continue to use the relationship between addition and subtraction ~ double any two-digit number by doubling tens first ~ use known number facts and place value to multiply or divide, including multiplying and dividing by 10 and then 100 ~ partition to carry out multiplication ~ use doubling or halving ~ use closely related facts to carry out multiplication and division ~ use the relationship between multiplication and division
Mental Calculations **Children should be able to calculate mentally:**	~ find what must be added to any two-digit number to make 100, e.g. 37 + ? = 100 ~ add or subtract any pair of two-digit numbers, e.g. 38 + 85, 92 − 47 ~ find out what must be added to/subtracted from any two- or three-digit number to make the next higher/lower multiple of 100, e.g. 374 + ? = 400, 826 - ? = 800 ~ subtract any four-digit number from any four-digit number when the difference is small, e.g 3641 − 3628, 6002 − 5991 ~ double any whole number from 1 to 50, e.g. double 36, and find all the corresponding halves, e.g. 96 ÷ 2 ~ double any multiple of 10 to 500, e.g. 380 x 2, and find all the corresponding halves, e.g. 760 ÷ 2, 130 ÷ 2 ~ double any multiple of 5 to 100, e.g. 65 x 2 ~ multiply any two-digit number by 10, e.g. 26 x 10 ~ divide a multiple of 100 by 10, e.g. 600 ÷ 10 ~ multiply any two-digit multiple of 10 by any single-digit number

Year 5

Rapid Recall	~ multiplication facts up to 12 x 12 and corresponding division facts Derive: ~ sums and differences of decimals, e.g. 6.5 ± 2.7 doubles and halves of decimals, e.g. half of 5.6
Mental Strategies Children should be able to use the following strategies, as appropriate, for mental calculations:	~ count up through the next multiple of 10, 100 or 1000 ~ reorder numbers in a calculation ~ partition into hundreds, tens and units, adding the most significant digit first ~ use known number facts and place value to add or subtract pairs of three-digit multiples of 10 and two-digit numbers with one decimal place ~ add or subtract the nearest multiple of 10 or 100 then adjust ~ identify near doubles ~ add several numbers ~ develop further the relationship between addition and subtraction ~ use factors ~ partition to carry out multiplication ~ use doubling and halving ~ use closely related facts to carry out multiplication and division ~ use the relationship between multiplication and division ~ use knowledge of number facts and place value to multiply or divide
Mental Calculations Children should be able to calculate mentally:	~ add or subtract any pair of three-digit multiples of 10, e.g. 570 + 250, 620 – 380 ~ find what must be added to a decimal fraction with units and tenths to make the next higher whole number, e.g. 4.3 + ? = 5 ~ add or subtract any pair of decimal fractions each with units and tenths, or each with tenths and hundredths, e.g. 5.7 + 2.5, 0.63 – 0.48 ~ subtract a four-digit number just less than a multiple of 1000 from a four-digit number just more than a multiple of 1000, e.g. 5001-1997 ~ multiply any two- or three-digit number by 10 or 100, e.g. 79 x 100, 363 x 100 ~ divide a multiple of 100 by 10 or 100, e.g. 4000 ÷ 10, 3600 ÷ 100 ~ multiply any two-digit multiple of 10 y a single-digit, e.g. 60 x 7, 90 x 6 ~ double any whole number from 1 to 100, multiples of 10 to 1000, and find corresponding halves ~ find 50%, 25%, 10% of small whole numbers or quantities, e.g. 25% or £8

Year 6

Rapid Recall	~ multiplication and division facts involving decimals, e.g. 0.8 x 7 and 4.8 ÷ 6 ~ squares of numbers to 12 x 12 and the corresponding squares of multiples of 10
Mental Strategies Children should be able to use the following strategies, as appropriate, for mental calculations:	~ consolidate all strategies from previous years ~ use knowledge of number facts and place value to add or subtract pairs of three-digit multiples of 10 and two-digit numbers with one decimal place ~ add or subtract the nearest multiple of 10, 100 or 1000, then adjust ~ continue to use the relationship between addition and subtraction ~ use factors ~ partition to carry out multiplication ~ use doubling and halving ~ use closely related facts to carry out multiplication and division ~ use the relationship between multiplication and division ~ use knowledge of number facts and place value to multiply or divide
Mental Calculations Children should be able to calculate mentally:	~ multiply any two-digit number by a single-digit, e.g. 34 x 6 ~ multiply any two-digit number by 50 or 25, e.g. 23 x 50, 47 x 25 ~ multiply or divide any whole number by 10 or 100, giving any remainder as a decimal, e.g. 47 ÷ 10 = 4.7, 1763 ÷ 100 = 17.63 ~ find squares of multiples of 10 to 100 ~ find any multiple of 10% of a whole number or quantity, e.g. 70% of £20, 50% of 5kg, 20% of 2 metres