Horton Park Primary School

Mental Calculation Policy

September 2014

Reviewed – September 2016

	Recall: **Children should be able to derive and recall:**	**Mental Calculation skills:** **Working mentally, with jottings if needed, children should be able to:**	**Mental methods or strategies:** **Children should understand when to and be able to apply these strategies:**
Year 1			
Adding and subtracting pairs of numbers	• Number pairs with a total of 10, e.g. 3+7, or what to add to a single-digit number to make 10, e.g. 3+Δ=10 • Addition facts for totals to at least 5, e.g. 2+ 3, 3+4	• Add or subtract a pair of single-digit numbers, e.g. 4+5, 8-3 • Add or subtract a single-digit number to or from a teens number, e.g.13-5, 17-3 • Add or subtract a single-digit to or from 10, and add a multiple of 10 to a single-digit number, e.g. 10+7, 7+30	• Reorder numbers when adding, e.g. put the larger number first • Count on or back in ones, twos or tens • Partition small numbers, e.g. 8+3=8+2+1 • Partition and combine tens and ones

Doubling numbers	• Addition doubles for all numbers to at least 10, e.g. 8+8	• Add near doubles, e.g. 6+7	• Partition: double and adjust, e.g. 5+6=5+5+1
Number sequences	• Odd and even numbers to 20	• Count on and back to 0 in ones, twos, fives or tens	• Use patterns of last digits, e.g. 0 and 5 when counting in fives
Year 2			
Adding and subtracting pairs of numbers	• Addition and subtraction facts for all numbers up to at least 10, e.g. 3+4, 8-5 • Number pairs with totals to 20	• Add or subtract a pair of single-digit numbers including crossing 10, e.g. 5+8, 12-7 • Add or subtract a single-digit number to or from a two-digit number, including crossing the tens boundary, e.g. 52-7	• Reorder numbers when adding • Partition: bridge through 10 and multiples of 10 when adding or subtracting
Calculations using multiples of tens	• All pairs of multiples of 10 with totals up to 100, e.g. 30+70,	• Add or subtract any single-digit number to or from a multiple of 10, e.g. 60+5,	• Partition and combine multiples of tens and ones

	or 60+Δ=100 • What must be added to any 2-digit number to make the next multiple of 10, e.g. 52+Δ=60	80-7 • Add or subtract a multiple of 10 to or from any two-digit number, e.g. 27+60, 72-50 • Add 9, 19, etc or 11, 21, etc	• Use knowledge of pairs making 10 • Count on in tens or ones to find totals • Count on or back in tens or ones to find the difference • Partition: add a multiple of 10 and adjust by 1
Doubling and halving	• Addition doubles for all numbers to 20, e.g. 17+17 and multiples of 10 to 50, e.g. 40+40 and all corresponding halves	• Double any multiple of 5 up to 50, e.g. double 35 • Add near doubles, e.g. 13+14 • Find half of even numbers to 40	• Partition: double the tens and ones separately, then recombine • Partition: double and adjust • Use knowledge that halving is the inverse of doubling and that doubling is equivalent to multiplying by two

Multiplication and division facts	• Multiplication facts for the 2, 5 and 10 times-tables and corresponding division facts • Odd and even numbers to 100	• Find the total number of objects when they are grouped into 2, 5 or 10	• Use knowledge of multiplication facts from the 2, 5 and 10 times-tables, e.g. recognise that there are 15 objects altogether because there are 3 groups of 5
Year 3			
Adding and subtracting pairs of numbers	• Addition and subtraction facts for all numbers to 20, e.g. 17-9, drawing on knowledge of inverse operations	• Add and subtract groups of small numbers, e.g. 5-3+2 • Add and subtract 2-digit numbers, e.g. 34+65	• Reorder numbers when adding • Partition: count on in tens and ones to find the total • Partition: count on or back in tens and ones to find the difference • Use knowledge that halving is the inverse of doubling

Calculations involving tens (and multiples of ten) and hundreds	• Sums and differences of multiples of 10, e.g. 50+80 • Pairs of 2-digit numbers with a total of 100, e.g. 32+68	• Add or subtract a 2-digit number to or from a multiple of 10, e.g. 50-38 • Multiply 1-digit or 2-digit numbers by 10 or 100, e.g. 46x10	• Identify pairs totalling 10 or multiples of 10 • Partition: add or subtract 10 or 20 and adjust • Recognise that when multiplying by 10 or 100 the digits move one or two places to the left and 0 is a place holder
Doubling and halving	• Addition doubles for multiples of 10 to 100, e.g. 90+90 and corresponding halves	• Add near doubles, e.g. 18+16 • Double any multiple of 5 up to 100, e.g. double 35 • Halve any multiple of 10 up to 200, e.g. halve 170	• Partition: add, double or halve tens and ones separately then recombine • Partition: double and adjust

Time			• Partition: count on or back in minutes and hours, bridging through 60 (analogue)
Multiplication and division facts	• Multiplication facts and corresponding division facts for 2, 3, 4, 5, 6, and 10 times-tables	• Find unit fractions of numbers and quantities involving halves, thirds, quarters, fifths and tenths	• Recognise that finding a unit fraction is equivalent to dividing by the denominator and use knowledge of division facts
Year 4			
Calculations involving tens, hundreds and thousands	• Sums and differences of pairs of multiples of 10, 100, 1000 • What must be added to any 3-digit number to make the next multiple of 100, e.g. 521+ =600	• Add or subtract a near-multiple of 10, e.g. 56-29 • Add or subtract 2-digit or 3-digit multiples of 10, e.g. 140+170 • Multiply and divide numbers to 1000 by 10 and then 100,	• Count on or back in hundreds, tens, ones • Add or subtract a multiple of 10 and adjust, e.g. 56-29=56-30+1 • Use knowledge of place value and related calculations,

		e.g. 850 divided by 10 • Multiply a multiple of 10 to 100 by a single digit number , e.g. 40x3	e.g. 140+150=290 using 14+15=19 • Use understanding that when a number is multiplied or divided by 10 or 100, its digits move one or two places to the left of the right and 0 is used as a place holder • Use knowledge of multiplication facts and place value, e.g. 7x8=56 to find 70x8 or 7x80
Adding and subtracting 2-digit numbers	•	• Add or subtract any pair of 2-digit numbers, including crossing the tens and 100 boundary, e.g. 47+58	• Partition: add tens and ones separately and recombine • Partition: subtract tens and then ones, e.g. subtracting 27 by subtracting 20 then 7

			• Subtract by counting up from the smaller to the larger number
Doubling and halving	• Doubles of multiples of 10 and 100 and corresponding halves • Addition doubles of numbers 1 to 100, e.g.38+38 and the corresponding halves	• Halve any even number to 200 • Add near doubles of 2-digit numbers, e.g. 38+37	• Partition: double/halve tens and ones separately, recombine and adjust
Time			• Partition: count on or back in minutes and hours, bridging through 60 (analogue and digital)
Multiplication and division facts	• Multiplication facts to 10x10 and the corresponding division facts • Factor pairs for known multiplication	• Multiply numbers to 20 by a single digit, e.g. 17x3 • Identify remainders when dividing by 2, 5, 10	• Use partitioning and the distributive law to multiply, e.g. 13x4=(10x4) + (3x4)

	facts	• Give the factor pair associated with a multiplication fact , e.g. 2x3=6 so 2 and 3 are factors	
Fractions and decimals	• Fraction and decimal equivalents of one half, quarters, tenths, and hundredths • Pairs of fractions that total 1	• Find unit fractions and simple non-unit fractions of numbers and quantities, e.g.3/8 of 24	
Year 5			
Decimals, fractions and percentages	• Sums and differences of decimals, e.g. 6.5 +2.7 • What must be added to a decimal with units and tenths to make the next whole number, e.g. 7.2 + ? =8 • Related unit fractions	• Add or subtract any pairs of decimals with units and tenths, e.g. 5.7-2.9 • Find fractions of whole numbers or quantities, e.g. 2/3 of 70kg • Find 50%, 25%, 10% of whole	• Use knowledge of place value and related calculations, e.g. 6.3-4.8 using 63-48 • Subtract by counting up from the smaller number to the larger number

	of multiplication/division facts, e.g. 1/9 of 63 is 7 • Percentage equivalents of one half, one quarter, three quarters, tenths and hundredths	numbers or quantities, e.g. 10% of £80	• Use knowledge of equivalence between fractions and percentages
Calculations involving multiples of 10, 100, 1000	• What must be added to any 4-digit number to make the next multiple of 1000, e.g. 4087 +? = 5000	• Add or subtract a pair of 2-digit numbers or 3-digit multiples of 10, e.g. 47+86 or 620-240 • Add or subtract a near-multiple of 10 or 100 to any 2-digit or 3-digit number, e.g. 235-198 • Find the difference between near multiples of 100, e.g. 607-588, or of	• Count on or back in hundreds, tens, ones and tenths • Partition: add hundreds, tens, ones separately and recombine • Add or subtract a multiple of 10 or 100 and adjust • Form an equivalent calculation, e.g. to multiply by 5, multiply by 10 then

		1000, e.g. 6070-4087 • Multiply 2-digit numbers by 5 or 20, e.g. 14x20 • Multiply by 25 or 50 , e.g. 48x25 • Multiply and divide whole numbers and decimals by 10, 100 or 1000 • Multiply pairs of multiples of 10, e.g. 60x30, and a multiple of 100 by a single digit, e.g. 900x8 • Divide a multiple of 10 by a single digit	halve • Use understanding that when a number is multiplied or divided by 10 or 100, its digits move one or two places to the left of the right and 0 is used as a place holder • Use knowledge of multiplication and division facts and understanding of place value, e.g. when calculating with multiples of 10
Doubling and halving	• Doubles and halves of decimals	• Double 3-digit multiples of 10 to 500, e.g. 380x2 and find corresponding	• Multiply or divide by 4 or 8 by repeated doubling or halving • Partition: double

		halves • Multiply and divide 2-digit numbers by 4 or 8, e.g. 96 divided by 8	and adjust
Time			• Partition: count on or back in minutes and hours, bridging through 60 (analogue and digital)
Multiplication and division facts	• Squares to 10x10 • Factor pairs to 100	• Find the remainder after dividing a 2-digit by a single digit number • Find factor pairs for numbers to 100	• Use knowledge of division facts to find a remainder • Use knowledge of multiplication and division facts to find factor pairs
Year 6			
Addition and subtraction facts		• Add or subtract pairs of decimals with units, tenths or hundredths	

		• Add or subtract a decimal with units and tenths that is nearly a whole number, e.g. 6.5-3.8	
Calculations involving tenths, hundredths, multiples of 10 and 100, etc	• Addition and subtraction facts for multiples of 10 to 1000 and decimal numbers with one decimal place, e.g. 660+?=930, ?-1.8=2.5 • What must be added to a decimal with units, tenths and hundredths to make the next whole number, e.g. 7.26+?=8 • Squares of multiples of 10 •	• Divide by 25 or 50, e.g. 2300 divided by 25 • Multiply pairs of multiples of 10 and 100, e.g. 50x30 • Divide multiples of 100 by a multiple of of 10 or 100, e.g. 600 divided by 20	• Count on or back in hundreds, tens, ones, tenths, hundredths • Use knowledge of place value and related calculations, e.g. 680-430, 6.8-4.3, 0.68-0.43, etc can all be worked out from 68-43 • Form an equivalent calculation, e.g. to divide by 25, divide by 100 then multiply by 4

Doubling and halving		• Find doubles of decimals each with units and tenths • Add near doubles of decimals • Double decimals with units and tenths and the corresponding halves, e.g. half of 15.2	• Partition: double and adjust • Partition: add or subtract a whole number and adjust, e.g. 4.3-2.9= 4.3-3+0.1
Time			• Count on or back in minutes and hours, bridging through 60 (analogue, digital, 12 hour and 24 hour)

Multiplication and division facts	• Squares to 12x12 • Prime numbers less than 100	• Multiply pairs of 2-digit and single digit numbers • Divide a 2-digit number by a single digit number • Multiply and divide 2-digit decimals such as 4.8 divided by 6 • Identify numbers with odd and even numbers of factors and no factor pairs other than 1 and themselves • Scale up and down using known facts, e.g. 3 oranges cost 24p so 4 oranges cost ?	• Partition: use partitioning and the distributive law to divide tens and ones separately, e.g. 94 divided by 4 = (80+12) divided by 4 • Recognise how to scale up or down using division or multiplication, e.g. 24p divided by 3 = 8, 4x 8 = 32p • Use knowledge of multiplication and division facts to identify factor pairs and numbers with only two factors
Percentages and fractions	• Equivalent fractions, decimals, percentages for	• Find 10% or multiples of 10%, of whole numbers and	• Use knowledge of the equivalence between fractions

	hundredths	quantities • Simplify fractions by cancelling	and percentages and the relationship between fractions and division