









.2	Recall:	Mental calculation skills:	Mental methods or strategies:
Year	Children should be able to derive and recall:	Working mentally, with jottings if needed, children	Children should understand when to and be
+ and -	 addition and subtraction facts for all numbers up to at least 20, e.g. 13 + 4, 18 - 5 number pairs with totals to 20 all pairs of multiples of 10 with totals up to 100, e.g. 30 + 70, or 60 + 2 = 100 derive and use related facts up to 100 what must be added to any two-digit number to make the next multiple of 10, e.g. 52 + 2 = 60 addition doubles for all numbers to 20, e.g. 17 + 17 and multiples of 10 to 50, e.g. 40 + 40 add and subtract mentally a 2 digit and a 1 digit, 2 digit and 10's, 2 digit and 2 digit 	should be able to: • add or subtract a pair of single-digit numbers. including crossing 10, e.g. 5 + 8, 12 - 7 • add any single-digit number to or from a multiple of 10, e.g. 60 + 5 • subtract any single-digit number from a multiple of 10, e.g. 80 - 7 • add or subtract a single-digit number to or from a two- digit number, including crossing the tens boundary, e.g. 23 + 5, 57 - 3, then 28 + 5, 52 - 7 • add or subtract a multiple of 10 to or from any two-digit number, e.g. 27 + 60, 72 - 50 • add 9, 19, 29, or 11, 21, 31, • add near doubles, e.g. 13+14, 39+40 • $59 + 20$	 able to apply these strategies: reorder numbers when adding partition: bridge through 10 and multiples of 10 when adding and subtracting partition and combine multiples of tens and ones use knowledge of pairs making 10 partition: count on in tens and ones to find the total partition: count on or back in tens and ones to find the difference partition: add a multiple of 10 and adjust by 1 partition: double and adjust
x and ÷	• doubles of all numbers to 20, e.g. double 13, and corresponding halves • doubles of multiples of 10 to 50, e.g. double 40, and corresponding halves • multiplication facts for the 2, 5 and 10 times-tables, and corresponding division facts • odd and even numbers to 100 $11_{11_{11_{11_{11_{11_{11_{11_{11_{11_$	 double any multiple of 5 up to 50, e.g. double 35 halve any multiple of 10 up to 100, e.g. halve 90 find half of even numbers to 40 find the total number of objects when they are organised into groups of 2, 5 or 10 	 partition: double the tens and ones separately, then recombine use knowledge that halving is the inverse of doubling and that doubling is equivalent to multiplying by two 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 three groups of five





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		should be able to:	to apply these strategies:
+ and -	 addition and subtraction facts for all numbers to 20, e.g. 9 + 8, 17 – 9, drawing on knowledge of inverse operations sums and differences of multiples of 10, e.g. 50 + 80, 120 – 90 pairs of two-digit numbers with a total of 100, e.g. 32 + 68, or 32 + 12 = 100 addition doubles for multiples of 10 to 100, e.g. 90 + 90 add and subtract mentally a 3 digit and a 1 digit 3 digit and 10's 3 digit and 100's 	• add and subtract groups of small numbers, e.g. $5 - 3 + 2$ • add or subtract a two-digit number to or from a multiple of 10, e.g. $50 + 38$, $90 - 27$ • add and subtract two-digit numbers e.g. $34 + 65$, $68 - 35$ • add near doubles, e.g. $18 + 16$, $60 + 70$ 59 + 20 75 + 9 = 84 10 - 10 75 + 9 = 84	 reorder numbers when adding identify pairs totalling 10 or multiples of 10 partition: add tens and ones separately, then recombine partition: count on in tens and ones to find the difference partition: count on or back in tens and ones to find the difference partition: double and adjust partition: count on or back in minutes and hours, bridging through 60 (analogue
x and ÷	• multiplication facts for the 2, 3, 4, 5, 6, 8 and 10 times-tables, and corresponding division facts • doubles of multiples of 10 to 100, e.g. double 90, and corresponding halves • count from 0 in multiples of 4, 8, 50 and 100 18 $4x 6 = 24$ $6x 4 = 24$	 double any multiple of 5 up to 100, e.g. double 35 halve any multiple of 10 up to 200, e.g. halve 170 multiply one-digit or two-digit numbers by 10 or 100, e.g. 7 × 100, 46 × 10, 54 × 100 find unit fractions of numbers and quantities involving halves, thirds, quarters, fifths and tenths 1) Find ¹/₃ of 18 by sharing out the number equally into the three boxes. 	 partition: when doubling, double the tens and ones separately, then recombine partition: when halving, halve the tens and ones separately, then recombine recognise that finding a unit fraction is equivalent to dividing by the denominator that halving and doubling are inverse operations and use knowledge of division facts recognise that when multiplying by 10 or 100 the digits move one or two places to the left and zero is used as a place holder











5	Recall:	Mental calculation skills:	Mental methods or strategies:
Year	Children should be able to derive and recall:	Working mentally, with jottings if needed, children should be able to:	Children should understand when to and be able to apply these strategies:
+ and -	 sums and differences of decimals, e.g. 6.5 + 2.7, 7.8 - 1.3 Image: the image: t	 add or subtract a pair of two-digit numbers or three-digit multiples of 10, e.g. 38 + 86, 620 - 380, 350 + 360 add or subtract a near multiple of 10 or 100 to any two-digit or three-digit number mentally, e.g. 235 + 198 find the difference between near multiples of 100, e.g. 607 - 588, or of 1000, e.g. 6070 - 4087 (Use jottings to support this calculation: count up the difference on a number line, bridging through key multiples of 100): add or subtract any pairs of decimal fractions each with units and tenths, e.g. 5.7 + 2.5, 6.3 - 4.8 Introducing Decimals 964 + 98 = ? 1209 - 388 = 821 +800 +12	 count on or back in hundreds, tens, ones and tenths (starting from any integer or decimal) partition: add hundreds, tens or ones separately, then recombine 28 + 214 = 342. 28 + 214 = 342. 20 + 20 + 20 + 10 = 30 20 + 30 + 12 = 342. subtract by counting up from the smaller to the larger number (where efficient due to numbers close together or near multiples) 321-256 add the 'hops': 40 + 21 + 4 = 65 add or subtract a multiple of 10 or 100 and adjust (e.g. 235 + 198 (add 200 mentally and subtract 2); 964 + 88 (add 90, then subtract 2); 621 - 39 (subtract 40 then add 1 back on) partition: double and adjust use knowledge of place value and related calculations, e.g. 6.3 - 4.8, using 63 - 48 partition for calculation with time: count on or back in minutes and hours, bridging through 60 (analogue and digital times): Mental jottings as a 'time number line': + 55 min + 2 hr + 3 hr + 15 min 9:05 10:00 12:00 3:00





Red	call:	Mental calculation skills:	Mental methods or strategies:
Children should derive and recal	be able to Workin I: able to	ng mentally, with jottings if needed, children should be b:	Children should understand when to and be able to apply these strategies:
• Recall squares t • Recall squares t • Recall squares t • 1 2 3 4 5 6 7 8 9 10 11 • 2 6 6 8 10 12 4 6 18 20 22 • 3 6 5 10 12 4 6 18 20 22 • 4 8 12 5 10 22 23 28 46 46 • 5 10 15 20 22 30 35 40 65 30 55 • 6 12 5 18 24 22 24 55 40 67 • 7 14 21 28 35 42 7 48 55 40 77 • 8 16 24 32 40 45 56 47 77 88 91 • 10 20 20 40 50 66 70 50 90 90 10 10 • 11 22 33 46 56 47 77 88 91 10 22 • Recall division f to tables up to 12 related unit fraction so one-ninth of 63 seventh of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage one-half, one-quated the the source of 63 is 9 • Recall percentage	• mult • mult • e.g. 26 • mult • e.g. 26 • mult • e.g. 32 • mult • dout • e.g. 32 • mult • dout • e.g. 32 • mult • dout • e.g. 38 • find number • mult • dout • e.g. 38 • find • mult • e.g. 4.3 • mult • e.g. 4.3 • mult • e.g. 60 • divid e.g. 80 • find • e.g. 25 • find • e.g. 26 • mult • dout • e.g. 38 • find • mult • e.g. 4.3 • mult • e.g. 60 • divid • e.g. 27 • find • e.g. 30 • find • e.g. 30 • find	iply and divide two-digit numbers by 4 or 8, x 4, 96 ÷ 8 iply two-digit numbers by 5 or 20, 0×5 , 14 × 20 using doubling and halving iply by 25 or 50, e.g. 48 × 25, 32 × 50 ble three-digit multiples of 10 to 500, 0×2 , and find the corresponding halves, e.g. 760 ÷ 2 the remainder after dividing a two-digit number by a single-digit ir, e.g. 27 ÷ 4 = 6 R 3 iply and divide whole numbers and decimals by 10, 100 or 1000, 3×10 , 0.75×100 , $25 ÷ 10$, $673 ÷ 100$, $74 ÷ 100$ by and divide by 10, 100 and 100 $10 \hline 10 \hline 10 \hline 10 \hline 100$ $10 \hline 10 \hline 10 \hline 10 \hline 100$ $10 \hline 100$ $100 \ 100$ $100 \ 100$ by a single digit number, e.g. 900 × 8 e a multiple of 10 by a single-digit number (whole number answers) $\div 4$, 270 $\div 3$ fractions of whole numbers or quantities, $3 \ 027$, $4/5$ of 70 kg 50%, 25% or 10% of thole numbers or quantities, $\% \ 020$ kg, 10\% of £80 factor pairs for numbers to 100, has the factor pairs 1×30 , 2×15 , 3×10 and 5×6	 multiply or divide by 4 or 8 by repeated doubling or halving form an equivalent calculation, e.g. to multiply by 5, multiply by 10, then halve; to multiply by 20, double, then multiply by 10 use knowledge of doubles/halves and understanding of place value, e.g. when multiplying by 50 multiply by 100 and divide by 2 use knowledge of division facts, e.g. when to find a remainder use understanding that when a number is multiplied or divided by 10 or 100, its digits move one or two places to the left or the right relative to the decimal point, and zero is used as a place holder use knowledge of multiplication and division facts and understanding of place value, e.g. calculating with multiples of 10 use knowledge of equivalence between fractions and percentages, e.g. to find 50%, 25% and 10% use knowledge of multiplication and division facts to find factor pairs ('factor rainbows' – rainbow starts and ends with 1 and the number itself, then all the other possible pairs in order inside)





9	Recall:	Mental calculation skills:	Mental methods or strategies:
ear	Children should be able to derive	Working mentally, with jottings if needed, children should be able	Children should understand when to and be able
~	and recall:	to:	to apply these strategies:
+ and -	 addition and subtraction facts for multiples of 10 to 1000 and decimal numbers with one decimal place, e.g. 650 + 2 = 930, 2 - 1.4 = 2.5 what must be added to a decimal with units, tenths and hundredths to make the next whole number, e.g. 7.26 + 2 = 8 	 add or subtract pairs of decimals with units, tenths or hundredths, e.g. 0.7 + 3.38 find doubles of decimals each with units and tenths, e.g. 1.6 + 1.6 add near doubles of decimals, e.g. 2.5 + 2.6 add or subtract a decimal with units and tenths, that is nearly a whole 	 count on or back in hundreds, tens, ones, tenths and hundredths use knowledge of place value and related calculations, e.g. 680 + 430, 6.8 + 4.3, 0.68 + 0.43 can all be worked out using the related calculation 68 + 43 use knowledge of place value and of doubles of two-digit whole numbers partition: double and adjust partition: add or subtract a whole number and adjust, e.g. 4.3 + 2.9 = 4.3 + 3 - 0.1, 6.5 - 3.8 = 6.5 - 4 + 0.2 partition: count on or back in minutes and hours, bridging
		number, e.g. 4.3 + 2.9 (Strategy to teach: do 4.3 + 3, then subtract 0.1); 6.5 – 3.8 (do 6.5 subtract 4, then add 0.2 back on)	through 60 (analogue and digital times, 12-hour and 24-hour clock) (<i>Time number line jottings</i>): 9:05 10:00 12:00 3:00 3:15
x and ÷	• perform mental calculations with mixed operations and large numbers • prime numbers less than 100 • equivalent fractions, decimals and percentages for hundredths, e.g. 35% is equivalent to 0.35 or 35/100 $503 + \frac{50}{100} + \frac{1}{2} + 0.5$ $2554 + \frac{55}{100} + \frac{1}{4} + 0.25$ $2554 + \frac{75}{100} + \frac{3}{4} + 0.25$ $1054 + \frac{10}{100} + \frac{1}{10} + 0.1$ $7554 + \frac{75}{100} + \frac{3}{4} + 0.25$ $1054 + \frac{10}{100} + \frac{1}{10} + 0.1$ $7554 + \frac{75}{100} + \frac{3}{4} + 0.25$ $1054 + \frac{10}{100} + \frac{1}{10} + 0.1$ 100 - 1 + 0.100 $10%2/10 - 0.2 + 20/100 - 20%3/10 - 0.3 + 30/100 - 30%4/10 - 0.4 + 0.0100 + 00%$	• multiply pairs of two-digit and single-digit numbers, e.g. 28×3 • divide a two-digit number by a single-digit number, e.g. $68 \div 4$ • divide by 25 or 50, e.g. $480 \div 25$, $3200 \div 50$ • double decimals with units and tenths, e.g. double 7.6, and find the corresponding halves, e.g. half of 15.2 • multiply pairs of multiples of 10 and 100, e.g. 50×30 , 600×20 • divide multiples of 100 by a multiple of 10 or 100 (whole number answers), e.g. $600 \div 20$, $800 \div 400$, $2100 \div 300$ • multiply and divide two-digit decimals such as 0.8×7 , $4.8 \div 6$ using place value knowledge (e.g. $0.8 \times 7 = 8 \times 7 = 56$, then $\div 10 = 5.6$) • find 10% or multiples of 10%, of whole numbers and quantities, e.g. 30% of 50 ml, 40% of $£30$, 70% of 200 g • simplify fractions by cancelling • scale up and down using known facts, e.g. given that three oranges cost 24p, find the cost of four oranges • identify numbers with odd and even numbers of factors and no factor pairs other than 1 and themselves • 4	 partition: use partitioning and the distributive law to divide tens and ones separately, e.g. 92 ÷ 4 = (80 + 12) ÷ 4 = 20 + 3 = 23 form an equivalent calculation, e.g. to divide by 25, divide by 100, then multiply by 4; to divide by 50, divide by 100, then double use knowledge of the equivalence between fractions and percentages and the relationship between fractions and division recognise how to scale up or down using multiplication and division, e.g. if three oranges cost 24p:one orange costs 24 ÷ 3 = 8p four oranges cost 8 × 4 = 32p Use knowledge of multiplication and division facts to identify factor pairs and numbers with only two factors Factoring