St Saviour's Academy - Mental Maths Policy

Addition and Subtraction Strategies

Counting Forwards and Backwards
90 - 27 = 90 – 20 – 7 = (Count back in tens then ones)
3.2 + 0.6 = (Count on in tenths)
87 – 85 = 85 **+ 3** = 87 (Counting up to find the difference)

Reordering
12 + 17 + 8 + 3 = 12 + 8 + 17 + 3 =
45 – 7 – 5 = 45 – 5 – 7 =
5 + 7 + 9 + 11 + 13 =

Partitioning: Place Value (Paritioning second number is best as subtraction cannot always be done by partitioning both)
365 – 44 = 365 – 40 – 4 = 325 – 4 =
55 + 33 = 55 + 30 + 3 85 + 30 + 3 =

Partitioning: Bridging through a multiple of 10 or 100
57 + 34 = 57 + 30 + 3 + 1 =
85 – 37 = 85 – 30 – 5 – 2 =
84 – 35 = 35 + 5 + 40 + 4 =
607 – 288 (Count up – bridging through 10s/100s) 288 + 12 + 307

Compensating
95-78 95 – 80 + 2
138 + 69 138 + 70 - 1

Partitioning: Near Doubles
15 + 16 = 15 + 15 + 1
9 + 8 = 8 + 8 - 1
160 + 170 = 160 + 160 + 10 (Using 16 + 16 to help)

Adjusting both numbers
1265 – 997 = 1268 – 1000 = (Add three to each number)
5 – 2.98 = 5.02 – 3 = (Add 0.02 on to each number)
98 + 297 = 100 + 300 – 2 – 3
£15.00 - £4.95 = £15.05 - £5.00 (Add £0.05 on to each number)

Multiplication and Division Strategies

Doubling and Halving
16 x 2 = Double 16
62 ÷ 2 = Half of 62
18 x 4 = 18 x 2 x 2 (double then double again)

Using Factors
35 x 6 = 35 x 3 x 2 =
240 ÷ 6 = 240 ÷ 3 ÷ 2 =
4 x 200 = 4 x *100* x 2 =

Nearby Facts
8 x 8 =64 so 9 x 8 = 64 + (1x 8)
10 x 6 = 60 so 9 x 6 will be one less group of 6
100 x 6 = 600 so 99 x 6 will be one less group of 6 (subtract 6 from previous product)

Distributive Law (partitioning)
18 x 6 = (10 x 6) + (8 x 6)
21 x 7 = (11 x 7) + (10 x 7)

Commutativity
I know 9 groups of 5 is 45 (5x9=45) so 5 groups of 9 will also equal 45 (9x5=45)
Arrays should be used to illustrate this.

Using equivalent/related facts to multiply and divide by multiples of 10 and 100
4 x 5 = 20 so 40 x 5 = 200
7 x 8 = 56 so 700 x 8 = 5600

Moving the digits to make a number 10/100/1000 times larger or smaller.
23 x 10 = 230 (20 x 10 = 200 3 x 10 = 30)

Check using the inverse (particularly division)
350 ÷ 5 = 70 70 x 5 = 350

RECEPTION

RAPID RECALL		COUNTING AND PLACE VALUE		ADD		SUBTRACT		MULTIPLY		DIVIDE
Adding and subtracting 1 within 10 Number bonds to 5		Children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number		Calculate simple additions mentally. Using quantities and objects, they add and subtract 2 single-digit numbers and count on or back to find the answer.		Calculate simple subtractions mentally. Using quantities and objects, they add and subtract 2 single-digit numbers and count on or back to find the answer.		They solve problems, including doubling.		They solve problems, including halving and sharing.

YEAR 1

RAPID RECALL	COUNTING AND PLACE VALUE	ADD	SUBTRACT	MULTIPLY	DIVIDE
Number Bonds totalling 20 *Doubles within 10 (i.e. up to 5+5)* *Doubles within 20 (i.e. up to 10+10)* *Recall number bonds 1-10* *Adding and subtracting 1 and 2 within 20* *Adding and subtracting 10 within 20* *Find half of even numbers to 10 using knowledge of doubling to help.*	Count to and across 100, forward and backwards, beginning with 0 or 1, or from any given number Count in multiples of twos, fives and tens Count and read numbers to 100 in numerals Read numbers from 1 to 20 in numerals and words Given a number, identify one more and one less *Partition and combine a two digit number - tens and units (ones).*	Add one-digit and two-digit numbers to 20, including zero *Near doubles of numbers to 10*	Subtract one-digit and two-digit numbers to 20, including zero		Find ½ and ¼ of a set of objects

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YEAR 2

RAPID RECALL	COUNTING AND PLACE VALUE	ADD	SUBTRACT	MULTIPLY	DIVIDE
Add or subtract a pair of single-digit numbers, including crossing 10 quickly (e.g. 5 + 8) Derive and use related facts up to 100 eg-Pairs of multiples of 10 eg. 30 + 70= 100 60 + ? = 100 Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables. Doubles of all numbers to 20 and multiples of 10 (up to 100) Half of even numbers to 20 Half of multiples of 10 eg half of 60= 30, 90=45	Count in steps of 2, 3, and 5 from 0 Count in tens from any number, forward or backward Count in halves e.g. ½,1, 1 1/2 , 2, 2 ½ … Odd and even numbers to 100	Use and solve addition facts to 20 fluently Add numbers mentally, including: - a two-digit number and ones eg. 27 + 6 - a two-digit number and tens eg 36 +20 - two two-digit numbers - adding three one-digit numbers - Add near multiple of 10 eg 9,19.. 11, 21..	Use and solve subtraction facts to 20 fluently Subtract numbers mentally, including: - a two-digit number and ones eg. 27 – 6 - a two-digit number and tens eg 36 -20 - two two-digit numbers (crossing 10s boundaries)	Recall and use multiplication facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Know that multiplication of two numbers can be done in any order (commutative) Multiply single digit by x10 and use zero as a place holder	Recall and use division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers Divide any multiple of 10 by 10

YEAR 3

RAPID RECALL	COUNTING and PLACE VALUE	ADD	SUBTRACT	MULTIPLY	DIVIDE
Recall the multiplication and division facts for the 2, 3, 4, 5, 8 and 10 tables. Quickly recall addition and subtraction facts within 20 (e.g. 8 + 9, 17 – 9) Know pairs of numbers that total 100 (e.g. 36 + ? 73 + ?) *Double any multiple of 5 up to 100.* *Halve any multiple of 10 up to 200.* Adding by partitioning two 2-digit numbers (e.g. 64 + 25, 10 + 64)	Count from 0 in multiples of 2, 3, 4, 5, 8, 10, 50 and 100 Read and write numbers to 1000 in numerals and in words Find 10 or 100 more or less than a given number Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10	Add numbers mentally, including: - a three-digit number and ones eg 327 + 8 - a three-digit number and tens 428 + 40 - a three-digit number and hundreds 368 +200 Adding any two 2-digit numbers mentally 63 + 56, 63 + 58 Subtracting any two 2-digit numbers mentally 76 – 43, 76 – 47	Subtract numbers mentally, including: - a three-digit number and ones eg 327 - 8 - a three-digit number and tens 428 - 40 - a three-digit number and hundreds 368 -200	Recall and use multiplication facts for the 2, 3, 4, 5, 8 and 10 multiplication tables Multiple 2 digit numbers numbers by x10 and x100 using zero as a place holder Multiplying a single digit number by a multiple of 10 eg 7 x 30;	Recall and use multiplication and division facts for the 2, 3, 4, 5, 8 and 10 and 10 multiplication tables Divide any multiple of 10 by 10 eg 30÷ 10 Divide any multiple of 100 by 10 or 100 eg 2400÷100 Give ½ , ¼ , 1/5, 1/3 of any 2 digit number

YEAR 4

RAPID RECALL	COUNTING & PLACE VALUE	ADD	SUBTRACT	MULTIPLY	DIVIDE
Recall multiplication and division facts for multiplication tables up to 12 × 12 *Double any two-digit number (up to 50)* *Halve any even number to 100.*	Count in multiples of 6, 7, 9, 25 and 1000 Find 1000 more or less than a given number Count backwards through zero to include negative numbers Count up and down in hundredths; recognise that hundredths arise when dividing an object by a hundred and dividing tenths by ten Recognise and write decimal equivalents to ¼, ½, ¾ Recognise and write decimal equivalents of any number of tenths or hundredths Round decimals with one decimal place to the nearest whole number	Add and subtract fractions with the same denominator *Know pairs of fractions that total 1.* *Work out what must be added to any three digit number to make the next multiple of 100 (e.g. 521 + __ = 600)*	Estimate and use inverse operations to check answers to a calculation	Recall multiplication facts for multiplication tables up to 12 × 12 Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; Multiply multiples of 10 by multiples of 10 eg 60 x 20 Multiplying together three numbers eg 3 x 4 x 5 Recognise and use factor pairs and commutativity in mental calculations	Recall division facts for multiplication tables up to 12 × 12 Estimate and use inverse operations to check answers to a calculation Use place value, known and derived facts to divide mentally, including: dividing by 1; Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

YEAR 5

RAPID RECALL	COUNTING	ADD	SUBTRACT	MULTIPLY	DIVIDE
Identify multiples and factors, including finding all factor pairs of a number and common factors of two numbers Establish whether a number up to 100 is prime and recall prime numbers up to 19 Recall square numbers to 12 and cube numbers to 5 cubed. Recall fraction, decimal and percentage equivalence (e.g. ½, ¾ tenths, hundredths, thirds.)	Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000 Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero Read and write decimal numbers as fractions [e.g.: 0.71 = 71/100] Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents Round decimals with two decimal places to the nearest whole number and to one decimal place	Add numbers mentally with increasingly large numbers Add fractions with the same denominator and denominators that are multiples of the same number Know what to add to a decimal with units and tenths to make the next whole number (e.g. 7.2 + __ = 8) Know what to add to a four digit number to make the next multiple of 1000 (e.g. 4087 + ____ = 5000) Mentally calculate sums and differences of decimals (e.g. 6.5 + 2.7)	Subtract numbers mentally with increasingly large numbers Subtract fractions with the same denominator and denominators that are multiples of the same number Mentally calculate sums and differences of decimals (e.g. 6.5 + 2.7)	Multiply numbers mentally drawing upon known facts Multiply whole numbers and those involving decimals by 10, 100 and 1000	Divide numbers mentally drawing upon known facts Divide whole numbers and those involving decimals by 10, 100 and 1000

YEAR 6

RAPID RECALL	COUNTING AND PLACE VALUE	ADD	SUBTRACT	MULTIPLY	DIVIDE
Quickly multiply a two digit and a one digit number, using recall of multiplication facts. Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts Multiply and divide numbers by 10, 100 and 1000 (whole numbers)	Read, write, order and compare numbers up to 10 000 000 Determine the value of each digit in numbers up to 10 000 000 Use negative numbers in context, and calculate intervals across zero Identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places	Perform mental calculations, including with mixed operations and large numbers Add fractions with different denominators and mixed numbers, using the concept of equivalent fractions	Perform mental calculations, including with mixed operations and large numbers Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions	Perform mental calculations, including with mixed operations and large numbers Multiply numbers by 10, 100 and 1000 giving answers up to three decimal places Multiply one-digit numbers with up to two decimal places by whole numbers	Perform mental calculations, including with mixed operations and large numbers Divide numbers by 10, 100 and 1000 giving answers up to three decimal places Divide proper fractions by whole numbers [e.g.: 1/3 ÷ 2 = 1/6]