# Sacred Heart RC Primary School

## Mental Strategies Journey

Grid shows KS1 number bonds to secure – practised throughout school.


| + | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 + 0 | 0 + 1 | 0 + 2 | 0 + 3 | 0 + 4 | 0 + 5 | 0 + 6 | 0 + 7 | 0 + 8 | 0 + 9 | 0 + 10 |
| 1 | 1 + 0 | 1 + 1 | 1 + 2 | 1 + 3 | 1 + 4 | 1 + 5 | 1 + 6 | 1 + 7 | 1 + 8 | 1 + 9 | 1 + 10 |
| 2 | 2 + 0 | 2 + 1 | 2 + 2 | 2 + 3 | 2 + 4 | 2 + 5 | 2 + 6 | 2 + 7 | 2 + 8 | 2 + 9 | 2 + 10 |
| 3 | 3 + 0 | 3 + 1 | 3 + 2 | 3 + 3 | 3 + 4 | 3 + 5 | 3 + 6 | 3 + 7 | 3 + 8 | 3 + 9 | 3 + 10 |
| 4 | 4 + 0 | 4 + 1 | 4 + 2 | 4 + 3 | 4 + 4 | 4 + 5 | 4 + 6 | 4 + 7 | 4 + 8 | 4 + 9 | 4 + 10 |
| 5 | 5 + 0 | 5 + 1 | 5 + 2 | 5 + 3 | 5 + 4 | 5 + 5 | 5 + 6 | 5 + 7 | 5 + 8 | 5 + 9 | 5 + 10 |
| 6 | 6 + 0 | 6 + 1 | 6 + 2 | 6 + 3 | 6 + 4 | 6 + 5 | 6 + 6 | 6 + 7 | 6 + 8 | 6 + 9 | 6 + 10 |
| 7 | 7 + 0 | 7 + 1 | 7 + 2 | 7 + 3 | 7 + 4 | 7 + 5 | 7 + 6 | 7 + 7 | 7 + 8 | 7 + 9 | 7 + 10 |
| 8 | 8 + 0 | 8 + 1 | 8 + 2 | 8 + 3 | 8 + 4 | 8 + 5 | 8 + 6 | 8 + 7 | 8 + 8 | 8 + 9 | 8 + 10 |
| 9 | 9 + 0 | 9 + 1 | 9 + 2 | 9 + 3 | 9 + 4 | 9 + 5 | 9 + 6 | 9 + 7 | 9 + 8 | 9 + 9 | 9 + 10 |
| 10 | 10 + 0 | 10 + 1 | 10 + 2 | 10 + 3 | 10 + 4 | 10 + 5 | 10 + 6 | 10 + 7 | 10 + 8 | 10 + 9 | 10 + 10 |

| Year 1 |
|---|
| **Rapid recall** |
| Y1 facts on grid tested and recorded termly – including associated subtraction facts |
| **Mental strategies** |
| + 0 + 1 and + 2 (and –) to any number up to 20 (Just 0, 1, or 2 more/less) |
| +/- 10 to any 1 digit number including zero:10 + 7 = 17 |
| Notice **Number bonds** to 10 |
| **Doubling and halving:** double facts and halves to 5 + 5 (and 10 + 10) |
| **Near number bonds** to add two one digit numbers: "7 + 2 = 9 because 7 + 3 = 10 so it's just one less" or "8 + 3 mist be 11 because 8 + 2 = 10" |
| **Near double facts** e.g. "3 + 4 = 7 because double 3 is 6 so it's just one more". |
| **Partitioning:** Use number facts to add TO + O: "24 + 3… I know that 3 + 4 = 7 so 20 + 7 = 27" |
| **Adjusting:** 'make ten' supported by models and images e.g. 8 + 6 = 8 + 2 + 4 |

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## Mental Strategies Journey

| Year 2 |
|---|
| **Rapid recall** |
| Y1 and 2 facts on grid tested and recorded termly – including associated subtraction facts |
| 2, 5 and 10 times table multiplication and division facts |
| **Mental strategies** |
| **Number bonds** to 10 and **near number bonds** to add two or three single digit numbers |
| Spot **doubles** and **near doubles** to add two or three single digit numbers |
| Use **number bonds** to 20 and near number bonds to 20 to add 2 numbers |
| + 10 to any 2 digit number (support with models, images and hundred square) |
| **Partitioning:** Calculations with whole numbers which do not involve crossing place value boundaries- e.g. 23 + 45= ? by 40 + 5 +20 + 3 or 40 + 23 + 5 |
| **Counting on or back** in tens and ones to add or subtract – flexibility with number line |
| **Adjusting** +/- 9 and 11 by adding 10 then subtracting or adding 1 |
| **Adjusting: 'make ten'** supported by models and images e.g. 8 + 6 = 8 + 2 + 4 |
| +/- multiples of 10 where the answer is between 0 and 100 (e.g. 70 + 30 = 100, 20 + 40 = 60) |
| **Doubling and halving:** Derives doubles and halves of multiples of 10 up to 100 |
| **Doubling and halving:** Find the doubles to 100 using partitioning and halves of any even number to 100 |

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1x1 | 2x1 | 3x1 | 4x1 | 5x1 | 6x1 | 7x1 | 8x1 | 9x1 | 10x1 | | |
| 2 | 1x2 | 2x2 | 3x2 | 4x2 | 5x2 | 6x2 | 7x2 | 8x2 | 9x2 | 10x2 | | |
| 3 | 1x3 | 2x3 | 3x3 | 4x3 | 5x3 | 6x3 | 7x3 | 8x3 | 9x3 | 10x3 | | |
| 4 | 1x4 | 2x4 | 3x4 | 4x4 | 5x4 | 6x4 | | 8x4 | | 10x4 | | |
| 5 | 1x5 | 2x5 | 3x5 | 4x5 | 5x5 | 6x5 | 7x5 | 8x5 | 9x5 | 10x5 | | |
| 6 | 1x6 | 2x6 | 3x6 | 4x6 | 5x6 | 6x6 | | 8x6 | | 10x6 | | |
| 7 | 1x7 | 2x7 | 3x7 | 4x7 | 5x7 | 6x7 | | 8x7 | | 10x7 | | |
| 8 | 1x8 | 2x8 | 3x8 | 4x8 | 5x8 | 6x8 | | 8x8 | | 10x8 | | |
| 9 | 1x9 | 2x9 | 3x9 | 4x9 | 5x9 | 6x9 | | 8x9 | | 10x9 | | |
| 10 | 1x10 | 2x10 | 3x10 | 4x10 | 5x10 | 6x10 | 7x10 | 8x10 | 9x10 | 10x10 | | |
| 11 | 1x11 | 2x11 | 3x11 | 4x11 | 5x11 | 6x11 | | 8x11 | | 10x11 | | |
| 12 | 1x12 | 2x12 | 3x12 | 4x12 | 5x12 | 6x12 | | 8x12 | | 10x12 | | |



| Year 3 |
|---|
| **Rapid recall** |
| 3 and 6, 4 and 8 times table and associated division facts |
| Multiply 2 digit number by 10 |
| +/- multiples of 10 where the answer is between 0 and 100 (e.g. 70 + 30 = 100, 20 + 40 = 60) |
| Doubles and halves of multiples of 10 up to 100 |
| **Mental strategies** |
| **Counting on or back** in fives from any multiple of 5– e.g. 35+15=? by counting on in steps of 5 from 35 |
| **Counting on or back** in hundreds from any number e.g. 570 + 300= ? by counting on in hundreds from 570 |
| **Partitioning:** Calculations with whole numbers which involves crossing place value boundaries e.g. 42 – 28= ? by 42 – 2 – 20 - 6 |
| **Adjusting** multiples of 10 e.g. 38 + 68= ? by 38 + 70 – 2 or 45 – 29 = 45 – 30 + 1 |
| **Adjusting: 'make ten'** progressing to multiples of ten e.g 28 + 13 = 30 + 11 |
| **Near doubles** to numbers under 20 e.g. 18 + 16 is double 18 and subtract 2 or double 16 and add 2 |
| **Near doubles** to multiples of 10 e.g. 60 + 70 is double 60 and add 10 or double 70 and subtract 10 |
| **Doubling and halving:** Find the doubles and halves of any two-digit number and any multiple of 10 or 100– e.g. half 680 or double 73 |
| **Doubling and halving:** Multiply and divide by 4 by doubling/halving twice and 8 by doubling/halving again. – e.g. 34 x 4 = 34 x 2 x 2. |

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## Mental Strategies Journey

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 x1 | 2x1 | 3x1 | 4x1 | 5x1 | 6x1 | 7x1 | 8x1 | 9x1 | 10x1 | 11x1 | 12x1 |
| 2 | 1x2 | 2x2 | 3x2 | 4x2 | 5x2 | 6x2 | 7x2 | 8x2 | 9x2 | 10x2 | 11x2 | 12x2 |
| 3 | 1x3 | 2x3 | 3x3 | 4x3 | 5x3 | 6x3 | 7x3 | 8x3 | 9x3 | 10x3 | 11x3 | 12x3 |
| 4 | 1x4 | 2x4 | 3x4 | 4x4 | 5x4 | 6x4 | 7x4 | 8x4 | 9x4 | 10x4 | 11x4 | 12x4 |
| 5 | 1x5 | 2x5 | 3x5 | 4x5 | 5x5 | 6x5 | 7x5 | 8x5 | 9x5 | 10x5 | 11x5 | 12x5 |
| 6 | 1x6 | 2x6 | 3x6 | 4x6 | 5x6 | 6x6 | 7x6 | 8x6 | 9x6 | 10x6 | 11x6 | 12x6 |
| 7 | 1x7 | 2x7 | 3x7 | 4x7 | 5x7 | 6x7 | 7x7 | 8x7 | 9x7 | 10x7 | 11x7 | 12x7 |
| 8 | 1x8 | 2x8 | 3x8 | 4x8 | 5x8 | 6x8 | 7x8 | 8x8 | 9x8 | 10x8 | 11x8 | 12x8 |
| 9 | 1x9 | 2x9 | 3x9 | 4x9 | 5x9 | 6x9 | 7x9 | 8x9 | 9x9 | 10x9 | 11x9 | 12x9 |
| 10 | 1x10 | 2x10 | 3x10 | 4x10 | 5x10 | 6x10 | 7x10 | 8x10 | 9x10 | 10x10 | 11x10 | 12x10 |
| 11 | 1x11 | 2x11 | 3x11 | 4x11 | 5x11 | 6x11 | 7x11 | 8x11 | 9x11 | 10x11 | 11x 11 | 12x11 |
| | | 2x12 | 3x12 | 4x12 | 5x12 | 6x12 | 7x12 | 8x12 | 9x12 | 10x12 | 11x12 | 12x 12 |



| Year 4 |
|---|
| **Rapid recall** |
| All multiplication and division facts up to 12 x 12 |
| +/- multiples of 10 beyond 100 e.g. 50 + 60 = 110 |
| + or – multiples of 100 up to 1000 |
| Half of any even number to 100 |
| Multiply and 2 or 3 digit number by ten |
| **Mental strategies** |
| **Counting on or back** in tenths and/or hundredths- e.g. 3.2 + 0.6 = ? by counting on in tenths. 1.7 + 0.55=? by counting on in tenths and hundredths – flexibility with a number line |
| **Adjusting** multiples of 10 or 100 e.g. 138 + 69= ? by 138 + 70 – 1 or 299 – 48 = 300 – 48 – 1 |
| **Adjusting 'make ten'** progressing to 3 digit numbers e.g. 128 + 32 = 130 + 30 |
| **Partitioning:** Calculations with decimal numbers not crossing place value boundaries then crossing boundaries. E.g. 3.2 + 2.1 progressing to 3.7 + 6.8 |
| **Near doubles** to 100 e.g. 75 + 76 is double 76 and subtract 1 or double 75 and add 1. |
| **Doubling and halving:** Find the doubles and halves of any number up to 1,000 by partitioning |

| Year 5 |
|---|
| **Rapid recall** |
| +/- multiples of 1000 |
| Multiply and divide any number by 10 and 100 |
| Halves of any number to 100 (e.g. half of 22 = 11, half of 51 = 25.5) |
| Squares of all numbers up to 12 |
| Cubes of 2, 3, 4 and 5 |
| **Mental strategies** |
| **Adjusting** multiples with decimals e.g 2 ½ + 1 ¾ by 2½ + 2 – ¼ or 5.7 + 3.9 by 5.7 + 4.0 – 0.1 |
| Decimal **near doubles** to whole numbers e.g. 2.5 + 2.6 is double 2.5 add 0.1 or double 2.6 subtract 0.1. |
| **Doubling and halving:** Find the doubles and halves of any number up to 10,000 by partitioning – e.g. half of 32,202 by halving 3,000, 2000, 200 and 2 |
| **Doubling and halving:** Multiply by 50 by multiplying by 100 and halving e.g. 8 x 50= 8 x 100 divided by 2 |
| **Doubling and halving:** Double and half decimal number with up to one decimal place by portioning – e.g. half of 8.4 by halving 8 and halving 0.4 |

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## Mental Strategies Journey

| Year 6 |
|---|
| **Rapid recall** |
| Multiplication of multiples of 10 and 100 based on known facts (e.g. 40 x 40 = 1,600); |
| **Mental strategies** |
| **Adjusting** multiples with decimals e.g. 2 ½ + 1 ¾ by 2½ + 2 – ¼ or 5.7 + 3.9 by 5.7 + 4.0 – 0.1 |
| Decimal **near doubles** to whole numbers e.g. 2.5 + 2.6 is double 2.5 add 0.1 or double 2.6 subtract 0.1. |
| **Doubling and halving:** Find the doubles and halves of any number up to 10,000 by partitioning – e.g. half of 32,202 by halving 3,000, 2000, 200 and 2 |
| **Doubling and halving:** Multiply by 50 by multiplying by 100 and halving e.g. 8 x 50= 8 x 100 divided by 2 |
| **Doubling and halving:** Double and half decimal number with up to one decimal place by portioning – e.g. half of 8.4 by halving 8 and halving 0.4 |

**Reference:** https://thirdspacelearning.com/blog/33-mental-maths-strategies-ks2-checklist/