

## Mental Calculation Strategies Year 1 - 6

	Recall	Mental calculation skills	Mental methods/strategies	Multiplication facts
YEAR 1	<ul style="list-style-type: none"> <li>number pairs with a total of 20, e.g. <math>3 + 7</math>, or what to add to a number to make 20, e.g. <math>13 + \square = 20</math></li> <li>Addition and subtraction facts with all numbers to 20</li> <li>Doubles and halves of all numbers to 20</li> <li>Odd and even numbers to 20</li> </ul>	<ul style="list-style-type: none"> <li>Count on or back in ones</li> <li>add or subtract a pair of single-digit numbers, e.g. <math>4 + 5</math>, <math>8 - 3</math></li> <li>add or subtract a single-digit number to or from a teens number, e.g. <math>13 + 5</math>, <math>17 - 3</math></li> <li>add or subtract a single-digit to or from 10, and add a multiple of 10 to a single-digit number, e.g. <math>10 + 7</math>, <math>7 + 30</math></li> <li>add near doubles, e.g. <math>6 + 8</math></li> <li>count on from and back to zero in ones, twos, fives or tens</li> </ul>	<ul style="list-style-type: none"> <li>re order number when adding put larger one first</li> <li>count on or back in one, two or ten</li> <li>partition and combine tens and ones</li> <li>partition, double and adjust e.g. <math>6 + 7 = 6 + 6 + 1</math></li> <li>use patterns of last digits, e.g. 0 and 5 when counting in fives</li> </ul>	$\times 2$ $\times 5$ $\times 10$

**YEAR 2**

- addition and subtraction facts to 20 fluently and derive and use related facts up to 100
- all pairs of multiples of 10 with totals up to 100, e.g.  $30 + 70$ , or  $60 + \square = 100$
- what must be added to any two-digit number to make the next multiple of 10, e.g.  $52 + \square = 60$
- addition doubles for all numbers to 20, e.g.  $17 + 17$  and multiples of 10 to 50, e.g.  $40 + 40$
- odd and even numbers to 100
- double multiples of 10 to 100

- 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.  $13 + 14$ ,  $39 + 40$
- double any multiple of 5 to 50 halve any multiple of 10

- 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 (rounding and adjusting)
- partition: double and adjust
- use knowledge that halving is the inverse of doubling and that doubling is same as multiplying by 2

x2 x5 x10 x3 x11

**YEAR 3**

- 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  $32 + \square\square = 100$
- addition doubles for multiples of 10 to 100, e.g.  $90 + 90$

- 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.  $18 + 16$ ,  $60 + 70$

- 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 total
- partition: count on or back in tens and ones to find the difference
- partition: add or subtract 10 or 20 and adjust
- partition: double and adjust
- partition: count on or back in minutes and hours, bridging through 60 (analogue times)

$\times 2$   $\times 5$   $\times 10$   $\times 3$ ,  $\times 4$ ,  
 $\times 8$ ,  $\times 6$   $\times 11$

YEAR 4

- sums and differences of pairs of multiples of 10, 100 or 1000
- addition doubles of numbers 1 to 100, e.g.  $38 + 38$ , and the corresponding halves
- what must be added to any three-digit number to make the next multiple of 100, e.g.  $521 + \square\square = 600$
- pairs of fractions that total 1

- add or subtract any pair of two-digit numbers, including crossing the tens and 100 boundary, e.g.  $47 + 58$ ,  $91 - 35$
- add or subtract a near multiple of 10, e.g.  $56 + 29$ ,  $86 - 38$
- add near doubles of two-digit numbers, e.g.  $38 + 37$
- add or subtract two-digit or three-digit multiples of 10, e.g.  $120 - 40$ ,  $140 + 150$ ,  $370 - 180$

- count on or back in hundreds, tens and ones
- partition: add tens and ones separately, then 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
- partition: add or subtract a multiple of 10 and adjust, e.g.  $56 + 29 = 56 + 30 - 1$ , or  $86 - 38 = 86 - 40 + 2$
- partition: double and adjust
- use knowledge of place value and related calculations, e.g. work out  $140 + 150 = 290$  using  $14 + 15 = 29$
- partition: count on or back in minutes and hours, bridging through 60 (analogue and digital times)

$\times 2$   $\times 5$   $\times 10$   $\times 3$ ,  $\times 4$ ,  
 $\times 8$ ,  $\times 11$ ,  $\times 7$   $\times 9$   $\times 12$

Know all timetable facts to  $12 \times 12$

**YEAR 5**

- sums and differences of decimals, e.g.  $6.5 + 2.7$ ,  $7.8 - 1.3$
- doubles and halves of decimals, e.g. half of 5.6, double 3.4
- what must be added to any four-digit number to make the next multiple of 1000, e.g.  $4087 + \square\square = 5000$
- what must be added to a decimal with units and tenths to make the next whole number, e.g.  $7.2 + \square\square = 8$

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, e.g.  $235 + 198$

find the difference between near multiples of 100, e.g.  $607 - 588$ , or of 1000, e.g.  $6070 - 4087$

add or subtract any pairs of decimal fractions each with units and tenths, e.g.  $5.7 + 2.5$ ,  $6.3 - 4.8$

- count on or back in hundreds, tens, ones and tenths
- partition: add hundreds, tens or ones separately, then recombine
- subtract by counting up from the smaller to the larger number
- add or subtract a multiple of 10 or 100 and adjust
- partition: double and adjust
- use knowledge of place value and related calculations, e.g.  $6.3 - 4.8$  using  $63 - 48$
- partition: count on or back in minutes and hours, bridging through 60 (analogue and digital times)

Quick recall of all times table facts and related division facts  
Square numbers  
Cube numbers

**YEAR 6**

addition and subtraction facts for multiples of 10 to 1000 and decimal numbers with one decimal place, e.g.  $650 + \square\square = 930$ ,  $\square\square - 1.4 = 2.5$

- what must be added to a decimal with units, tenths and hundredths to make the next whole number, e.g.  $7.26 + \square\square = 8$

- 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 number, e.g.  $4.3 + 2.9$ ,  $6.5 - 3.8$

- 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 through 60 (analogue and digital times, 12-hour and 24-

Quick recall of all number facts from previous years