'adding the places'
Start with one addend, then add the value of the digits of the other addend(s).

\[
\begin{align*}
35 + 23 &= \quad \text{think} \\
35 + 20 + 3
\end{align*}
\]

'bridging to ten'
Start with one addend, count up to the next multiple of 10 (100, 1000, etc.), then add the balance of the second addend.
Synonyms: 'bridge the decades'; 'bridge to ten'; 'make a ten'; 'use ten'

\[
\begin{align*}
17 + 8 &= \quad \text{think} \\
17 + 3 + 5
\end{align*}
\]

'compensating'
Round one or both addends before adding, then adjust the answer to compensate for the rounding.
Synonyms: 'compensation'; 'round and adjust'; 'round or adjust'

\[
\begin{align*}
28 + 36 &= \quad \text{think} \\
(30 + 36) - 2
\end{align*}
\]

'counting on'
Start with one addend, then count on parts (not place) of the other addend.
Synonym: 'jump'
Sub-strategies: 'count-on-1'; 'count-on-2'; 'count-on-3'

\[
\begin{align*}
58 + 24 &= \quad \text{think} \\
58 + 10 + 10 + 4
\end{align*}
\]

'using compatible addends'
Choose pairs of addends to make the calculation more manageable. This strategy applies only when there are three or more addends.
Synonym: 'use compatible pairs'

\[
\begin{align*}
14 + 23 + 16 &= \quad \text{think} \\
14 + 16 + 23
\end{align*}
\]

'using doubles'
Use a known nearby 'double'.
Synonym: 'near doubles'
Sub-strategies: 'double-plus-1'; 'double-plus-2'

\[
\begin{align*}
7 + 8 &= \quad \text{think} \\
7 + 8 &= 15 \\
because 7 + 7 &= 14
\end{align*}
\]

'using place value'
Expand the addends into places before adding the value of the digits in each place.
Synonym: 'split'

\[
\begin{align*}
56 + 17 &= \quad \text{think} \\
50 + 10 + 6 + 7 \\
or 6 + 7 + 50 + 10
\end{align*}
\]
Subtraction

'reducing'

'Subtracting the places'
Start with the minuend then subtract the value of the digits in the subtrahend.

68 - 35 = __

think

68 - 30 - 5

'thinking addition'
Use addition facts to solve a subtraction problem.

15 - 12 = __

think

12 + 3 is 15
so 15 - 12 is 3

'using place value'
Expand the minuend and subtrahend and subtract the value of the digits in each place.

56 - 32 = __

think

(50 - 30) + (6 - 2)

'jumping back'

'See'

68 - 35 = __

think

68 - 30 - 5

83 - 58 = __

think

80 - 55
(subtract 5 from each)

45 - 12 = __

think

45 - 5 - 7

82 - 35 = __

think

(80 - 35) + 2

86 - 24 = __

think

86 - 10 - 10 - 4
Multiplication

3 \times 4 = 12

- **Breaking a factor**
  - Split one factor into manageable parts before multiplying each part and doing the partial products.

- **Building down**
  - Use a known fact that is greater than the given fact to calculate an unknown fact or its turnaround.

- **Building up**
  - Use a known fact that is less than the given fact to calculate an unknown fact or its turnaround.

- **Doubling**
  - Double or repeatedly double to multiply by 2, 4, 8 or any power of 2.

- **Factorising**
  - Break one (or more) factor(s) into two factors. All the factors are then considered. The strategy of 'using compatible factors' is often applied at this stage.

- **Recognising midpoints**
  - Identify one number as a midpoint between two known facts.

- **Doubling and halving**
  - Double one factor and halve another to make an equivalent number sentence that is more manageable to calculate mentally. The process could require repeated doubling and halving. At least one factor needs to be even.
Multiplication

'using a benchmark number'
Recognize that one of the factors is a unit fraction of a common benchmark such as 10, 100 or 1000.
Synonym: 'use ten'

\[
32 \times 5 = __
\]

think:
\[
32 \times 10 = 320, \text{ so } 32 \times 5 \text{ must be one half of } 320 \text{ (160)}
\]

see
\[
16 \times 25 = __
\]

think:
\[
16 \times 100 = 1600, \text{ so } 16 \times 25 \text{ must be one quarter of } 1600 \text{ (400)}
\]

using compatible factors'
Choose pairs of factors to make the calculation more manageable. This strategy applies only when there are free or more factors.
Synonym: 'use compatible pairs'

\[
2 \times 9 \times 5 = __
\]

think:
\[
(2 \times 5) \times 9
\]

using division'
Divide when multiplying by a group fraction or percentage.

\[
\frac{1}{2} \times 30 = __
\]

think:
\[
30 \div 5
\]

\[
10\% \text{ of } 180
\]

think:
\[
10\% \text{ of } 180 \text{ is the same as } \frac{1}{10} \text{ of } 180 \text{ is the same as } 180 \div 10
\]

Multiplication

'using place value'
Use the distributive property to multiply the places of one factor by each place of the other factor.
Synonym: 'multiply the parts'

\[
26 \times 3 = __
\]

think:
\[
(20 \times 3) + (6 \times 3)
\]
Division

12 ÷ 3 = 4

- **'adjusting'**
  Change the dividend and divisor by multiplying each number by the same amount to make the calculations more manageable.

  - **75 ÷ 5 =** __
  - **150 ÷ 10**
    (double each number)

- **'breaking the dividend'**
  Split the dividend into manageable parts (not places), before dividing each part and adding the quotients.
  Synonyms: 'break up the dividend'; 'divide the parts'

  - **138 ÷ 3 =** __
  - **(120 ÷ 3) + (18 ÷ 3)**

Division

- **'halving'**
  Halve or repeatedly halve to divide by 2, 4, 8 or any power of 2.

  - **112 ÷ 8 =** __
    think
    Half of 112 is 56
    Half of 56 is 28
    Half of 28 is 14

- **'thinking multiplication'**
  Use multiplication to solve a division problem.

  - **35 ÷ 7 =** __
    think
    7 × 5 is 35
    so 35 ÷ 7 is 5

- **'using place value'**
  Expand the dividend into places (or a combination of places) before dividing each place and adding the quotients.
  Synonym: 'expanding the dividend'

  - **318 ÷ 3 =** __
    think
    (300 ÷ 3) + (18 ÷ 3)