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

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

'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'

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

'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'

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

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

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

'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'

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

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

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

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

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

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

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

See

68 - 35 = __

Think

68 - 30 - 5

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

See

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.
Synonym: 'split'

See

56 - 32 = __

Think

(50 - 30) + (6 - 2)
## Multiplication

### Breaking a Factor
- Split one factor into manageable parts (not places) before multiplying each part and adding the partial products.

\[
3 \times 4 = 12
\]

- **Think:** 
  
  \[
  (25 \times 4) + (1 \times 4)
  \]

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

\[
19 \times 3 = __
\]

- **Think:** 
  
  \[
  19 \times 3 \text{ is 57 because } 20 \times 3 \text{ is 60}
  \]

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

\[
21 \times 3 = __
\]

- **Think:** 
  
  \[
  21 \times 3 \text{ is 63 because } 20 \times 3 \text{ is 60}
  \]

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

- Think: 
  
  \[
  \text{Double 14 is 28} \\
  \text{Double 28 is 56} \\
  \text{Double 56 is 112}
  \]

### 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.

\[
12 \times 15 = __
\]

- **Think:** 
  
  \[
  12 \times 4 = 48 \\
  48 \div 2 = 24 \\
  24 \times 15 = 360
  \]

### 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.

\[
15 \times 7 = __
\]

- **Think:** 
  
  \[
  3 \times 5 \times 7 \text{ or } 5 \times 3 \times 7
  \]

### Recognising Midpoints
- Identify one number as a midpoint between two known facts.

\[
8 \times 15 = __
\]

- **Think:** 
  
  \[
  8 \times 10 \text{ is 80} \\
  8 \times 20 \text{ is 160}
  \]

\[
8 \times 10 = 80
\]

\[
8 \times 20 = 160
\]

\[
8 \times 15 \text{ must be halfway between } 8 \times 10 \text{ (80)} \text{ and } 8 \times 20 \text{ (160)}
\]
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:
\[
32 \times 10 = 320, \text{ so } 32 \times 5 \text{ must be one half of } 320 (160)
\]

see
\[
16 \times 25 = __
\]

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

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

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

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

think:
\[
30 + 5
\]

see
10% of 180

think:

10% of 180 is the same as 180 + 180

(20 \times 3) + (6 \times 3)

think:

'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'

\[
26 \times 3 = __
\]
Division

12 ÷ 3 = 4

Dividend divisor quotient

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

75 ÷ 5 = __

Think
150 ÷ 10
(double each number)

138 ÷ 3 = __

Think
(120 ÷ 3) + (18 ÷ 3)

'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'

112 ÷ 8 = __

Think
Half of 112 is 56
Half of 56 is 28
Half of 28 is 14

35 ÷ 7 = __

Think
7 × 5 is 35
so 35 ÷ 7 is 5

318 ÷ 3 = __

Think
(300 ÷ 3) + (18 ÷ 3)

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

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