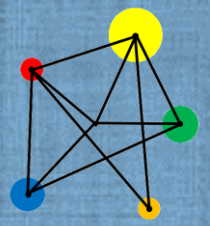
Mental Calculation



Use strategies to perform mental calculations

Vocabulary

Strategy
A plan to achieve a goal.

Addition

How would you carry out each of these additions mentally?

a) 137 + 82 + 73 + 38

b) 79 + 88

c) £2.99 + £4.99 + £1.99

Addition

How would you carry out each of these additions mentally?

a) 137 + 82 + 73 + 38

(137 + 73) + (82 + 38) = 210 + 120 = **330**

b) 79 + 88

80 + 90 – 3 = **167**

c) £2.99 + £4.99 + £1.99

£3 + £5 + £2 – 3p = **£9.97**

Exercise

Use a strategy to carry out the following additions mentally.

a) 91 + 89

b) 9.3 + 9.7

c) 7 + 8 + 3 + 2 + 6 + 4

d) 99 + 99 + 99

e) 496 + 225

f) 1999 + 1999

g) £1.99 + £17.99

h) 10 + 9 + …. + 2 + 1

Challenge

1 + 2 + 3 + ….+ 99 + 100

Suggested Solutions

Challenge

1 + 2 + 3 + ….+ 99 + 100

5050

Use a strategy to carry out the following additions mentally.

a) 91 + 89

90 + 90 = 180

b) 9.3 + 9.7

9 + 10 = 19

c) 7 + 8 + 3 + 2 + 6 + 4

10 + 10 + 10 = 30

d) 99 + 99 + 99

100 + 100 + 100 - 3 = 297

e) 496 + 225

500 + 225 - 4 = 721

f) 1999 + 1999

2000 + 2000 - 2 = 3998

g) £1.99 + £17.99

£2 + £18 – 2p = £19.98

h) 10 + 9 + …. + 2 + 1

5 x 11 = 55

Subtraction

How would you carry out these subtractions mentally?

What strategies could you use?

a) 47 - 9

b) 312 - 99

c) £8 - £4.99

d) 1 – 0.1 – 0.02 – 0.2

e) 10 - 22

Suggested Solutions

How would you carry out these subtractions mentally?

What strategies could you use?

a) 47 - 9

47 - 10 + 1 = 38

b) 312 - 99

312 - 100 + 1 = 213

c) £8 - £4.99

£8 - £5 + 1p = £3.01

d) 1 – 0.1 – 0.02 – 0.2

1 – 0.22 = 0.78

e) 10 - 22

- (22 – 10) = - 12

Multiplication

How would you carry out these calculations mentally?

What strategies could you use?

a) 50 x 4000

b) 36 x 25

c) 0.2 x 14

d) 0.3^2

Suggested Solutions

How would you carry out these calculations mentally?

What strategies could you use?

a) 50 x 4000

5 x 10 x 4 x 1000 = 200 000

b) 36 x 25

9 x 100 = 100

c) 0.2 x 14

2 x 1.4 = 2.8

d) 0.3^2

$$\frac{3}{10} \times \frac{3}{10} = \frac{9}{100} = 0.09$$

Exercise

Find a strategy to carry out these multiplications mentally?

a) 200 x 900

b) 8 x 15

c) 0.17 x 200

d) 0.1 x 0.2 x 0.3

e) 99 x 101

Challenge

$2^6 \times 5^6$

Solutions

Find a strategy to carry out these multiplications mentally?

a) 200 x 900

= 180 000

b) 8 x 15

= 120

c) 0.17 x 200

= 34

d) 0.1 x 0.2 x 0.3

= 0.006

e) 99 x 101

= 9 999

Challenge

$2^6 \times 5^6$

= 1 000 000

Division

How would you carry out these calculations mentally?

What strategies could you use?

a) $2000 \div 50$

b) $40 \div \frac{1}{2}$

c) $12 \div 0.1$

Suggested Solutions

How would you carry out these calculations mentally?

What strategies could you use?

a) $2000 \div 50$

$= 200 \div 5$

$= 40$

b) $40 \div \frac{1}{2}$

$= 40 \times 2$

$= 80$

c) $12 \div 0.1$

$= 120 \div 1$

$= 120$

Use a strategy to calculate mentally:

1. 89 + 23 + 7 + 21
2. £7.21 - £2.99
3. 200 x 31
4. 25 ÷ 0.2
5. 199 + 399 + 499
6. 12 + 4 ÷ 0.1

1. 3.9 + 2.4 – 0.9
2. 1 - 0.9 – 0.09
3. 8.1 x 0.5 ÷ 0.1
4. 99^2
5. $13 \div \frac{1}{5}$
6. $\sqrt{0.81}$

1. $\frac{\sqrt{2 - 99 + 101}}{\frac{1}{4}}$
2. $\sqrt{\frac{2 - 99 + 101}{\frac{1}{4}}}$

Challenge

1 + 3 + 5 + ….+ 97 + 99

Use a strategy to calculate mentally:

1. 89 + 23 + 7 + 21 **= 140**
2. £7.21 - £2.99 **= £4.22**
3. 200 x 31 **= 6200**
4. 25 ÷ 0.2 **= 125**
5. 199 + 399 + 499 **= 1097**
6. 12 + 4 ÷ 0.1 **= 52**

1. 3.9 + 2.4 – 0.9 **= 5.4**
2. 1 - 0.9 – 0.09 **= 0.01**
3. 8.1 x 0.5 ÷ 0.1 **= 40.5**
4. 99^2 **= 9801**
5. $13 \div \frac{1}{5}$ **= 65**
6. $\sqrt{0.81}$ **= 0.9**

1. $(1 - 0.7)^2$ **= 0.09**
2. $\dfrac{\sqrt{2 - 99 + 101}}{\frac{1}{4}}$ **= 4**

Challenge

1 + 3 + 5 + ….+ 97 + 99

= 2500

Extension

1 – 2 + 3 – 4 + 5 …… + 99 – 100 =

-1 + 2 - 3 + 4 - 5 …… - 99 + 100 =