Addition and Subtraction

8 + 5 = 13
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Addition mental strategies – jump strategy

When we add we can use the jump strategy to help us. Look at 257 + 32:

1. First we jump up by the tens
2. Then we jump up by the units

257 + 32 = 289

Warm up with jumping by tens up and down these ladders:

<table>
<thead>
<tr>
<th>289</th>
<th>224</th>
<th>335</th>
<th>115</th>
<th>432</th>
</tr>
</thead>
<tbody>
<tr>
<td>279</td>
<td>214</td>
<td>325</td>
<td>105</td>
<td>422</td>
</tr>
<tr>
<td>269</td>
<td>204</td>
<td>315</td>
<td>95</td>
<td>412</td>
</tr>
<tr>
<td>259</td>
<td>194</td>
<td>305</td>
<td>85</td>
<td>402</td>
</tr>
<tr>
<td>249</td>
<td>184</td>
<td>295</td>
<td>75</td>
<td>392</td>
</tr>
</tbody>
</table>

Use the jump strategy to complete these additions:

a. 575 + 52 = 627

b. 759 + 41 = 800

c. 135 + 73 = 208
Addition mental strategies – jump strategy

3 A group of friends each bought a bag of mixed lollies at a lolly bar. Practise using the jump strategy to solve each problem. Write your answer and any working out in the space below each problem:

a How much did Liam spend if he bought a scoop of jellybeans and a scoop of choc mints?

b How much did Ruby spend if she bought a scoop of cream chocs and a scoop of jubes?

Remember with addition, you can start with either number.

<table>
<thead>
<tr>
<th>55¢</th>
<th>65¢</th>
<th>75¢</th>
<th>85¢</th>
<th>95¢</th>
<th>$1.05</th>
<th>$1.15</th>
<th>$1.25</th>
<th>$1.35</th>
<th>$1.45</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>+ 10</th>
<th>+ 10</th>
<th>+ 10</th>
<th>+ 10</th>
<th>+ 10</th>
<th>+ 10</th>
<th>+ 10</th>
<th>+ 10</th>
<th>+ 10</th>
</tr>
</thead>
</table>

$1.70

c How much did Rea spend if she bought one scoop of each type?

$3.15

d Rachel spent $1.85 on 2 scoops of lollies. Use guess, check and improve to work out which 2 scoops she could have bought.

Choc mints and cream chocs.

4 Use the jump strategy to help you finish these addition walls. Can you see how they work?

<table>
<thead>
<tr>
<th>a</th>
<th>b</th>
<th>c</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>132</td>
<td>148</td>
</tr>
<tr>
<td>51</td>
<td>72</td>
<td>75</td>
</tr>
<tr>
<td>35</td>
<td>40</td>
<td>73</td>
</tr>
<tr>
<td>41</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>25</td>
<td>20</td>
<td>13</td>
</tr>
</tbody>
</table>
Addition mental strategies – split strategy

When adding large numbers in our heads it can be easier to split one of the numbers into parts and add each part separately.

\[
214 + 138 = 352
\]

**1** Use the split strategy to add the numbers. The first one has been done for you.

\[
\begin{align*}
a & \quad 623 + 28 \quad \underline{20} \quad \underline{8} \\
b & \quad 38 + 26 \quad \underline{20} \quad \underline{6} \\
c & \quad 156 + 142 \quad \underline{100} \quad \underline{40} \quad \underline{2}
\end{align*}
\]

\[
\begin{align*}
a & \quad 623 + 20 = 643 \\
b & \quad 38 + 20 = 58 \\
c & \quad 156 + 100 = 256
\end{align*}
\]

\[
\begin{align*}
643 + 8 & = 651 \\
58 + 6 & = 64 \\
296 + 2 & = 298
\end{align*}
\]

\[
\begin{align*}
156 + 142 & = 298
\end{align*}
\]

**2** These problems have been split and some have been solved already. Lucky, hey? You just have to work out what the second numbers were before they were split and answer any unsolved problems:

\[
\begin{align*}
a & \quad 416 + 90 + 1 = 507 \\
b & \quad 230 + 30 + 3 = \quad \underline{263} \\
c & \quad 283 + 60 + 7 = \quad \underline{350}
\end{align*}
\]

\[
\begin{align*}
\text{was} & \quad 416 + \underline{\underline{91}} \\
\text{was} & \quad 230 + \underline{\underline{33}} \\
\text{was} & \quad 283 + \underline{\underline{67}}
\end{align*}
\]

\[
\begin{align*}
d & \quad 532 + 60 + 1 = \quad \underline{593} \\
e & \quad 425 + 100 + 40 + 2 = \quad \underline{567} \\
f & \quad 129 + 200 + 40 + 6 = \quad \underline{375}
\end{align*}
\]

\[
\begin{align*}
\text{was} & \quad 532 + \underline{\underline{61}} \\
\text{was} & \quad 425 + \underline{\underline{142}} \\
\text{was} & \quad 129 + \underline{\underline{246}}
\end{align*}
\]

**3** Work out the answers to these questions by using the split strategy. See if you can do the working in your head. If it helps, make notes as you go:

\[
\begin{align*}
a & \quad 173 + 36 = \quad \underline{209} \\
b & \quad 446 + 51 = \quad \underline{497} \\
c & \quad 112 + 83 = \quad \underline{195}
\end{align*}
\]

\[
\begin{align*}
d & \quad 724 + 72 = \quad \underline{796} \\
e & \quad 475 + 122 = \quad \underline{597} \\
f & \quad 123 + 164 = \quad \underline{287}
\end{align*}
\]
Addition mental strategies – split strategy

4 Butterflies can fly great distances. Use the map and the split strategy to calculate the total distance flown by each butterfly in the table below:

<table>
<thead>
<tr>
<th>Flight Path</th>
<th>Distances to add</th>
<th>Total distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Field Crescent flies from Lotor to Villa and then to Seaport</td>
<td>55 + 45</td>
<td>100 km</td>
</tr>
<tr>
<td>The Painted Lady flies from Sept to Lotor and then to Villa</td>
<td>476 + 55</td>
<td>531 km</td>
</tr>
<tr>
<td>The Fawn flies from Seaport to Effe and then to Kia</td>
<td>235 + 75</td>
<td>310 km</td>
</tr>
<tr>
<td>The Monarch flies from Sept to Kia and then to Effe</td>
<td>452 + 75</td>
<td>527 km</td>
</tr>
</tbody>
</table>

We often use the split strategy when adding money. We split the amounts into dollars and cents, work out each part and then add the two answers together:

\[ \$28.50 + \$16.80 = (\$28 + \$16) + (\$0.50 + \$0.80) \]
\[ = \$44 + \$1.30 \]
\[ = \$45.30 \]

5 Match the price tags with the bills:

- $18.25 + $12.75 = $31
- $64.70 + $11.30 = $76
- $11.85 + $34.15 = $46
- $56.35 + $73.65 = $130
Addition mental strategies – compensation strategy

Sometimes we round one number in the problem to make it easier to do in our heads. Then we adjust our answer to compensate:

\[
405 + 69 = 474
\]

\[
405 + 70 - 1 \quad \text{I rounded up by 1}
\]

\[
475 - 1 = 474 \quad \text{so I subtract 1.}
\]

### 1. Warm up by rounding these numbers to the closest ten:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>48</td>
<td>50</td>
<td>b</td>
<td>67</td>
</tr>
<tr>
<td>e</td>
<td>89</td>
<td>90</td>
<td>f</td>
<td>456</td>
</tr>
</tbody>
</table>

### 2. Solve these problems using compensation:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>45 + 37 = 82</td>
<td>b</td>
<td>66 + 18 = 84</td>
<td></td>
</tr>
<tr>
<td></td>
<td>45 + 40 - 3</td>
<td>66 + 20 - 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>85 - 3 = 82</td>
<td>86 - 2 = 84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>86 + 49 = 135</td>
<td>d</td>
<td>124 + 57 = 181</td>
<td></td>
</tr>
<tr>
<td></td>
<td>86 + 50 - 1</td>
<td>124 + 60 - 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>136 - 1 = 135</td>
<td>184 - 3 = 181</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We can also round down to the closest ten. When we do this we add to compensate.

### 3. Round these numbers to the closest ten. Then compensate by adding:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>26 + 42 = 68</td>
<td>b</td>
<td>35 + 63 = 98</td>
<td></td>
</tr>
<tr>
<td></td>
<td>26 + 40 + 2</td>
<td>35 + 60 + 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>66 + 2 = 68</td>
<td>95 + 3 = 98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>96 + 21 = 117</td>
<td>d</td>
<td>145 + 34 = 179</td>
<td></td>
</tr>
<tr>
<td></td>
<td>96 + 20 + 1</td>
<td>145 + 30 + 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>116 + 1 = 117</td>
<td>175 + 4 = 179</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Addition mental strategies – compensation strategy

4 Connect the statements with their answer:
When we round down we compensate by subtracting
When we round up we compensate by adding

5 Solve these addition problems using compensation. Decide if you need to round up or down and compensate accordingly. Make as many notes as you need to:

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>425 + 67</td>
<td>b</td>
<td>673 + 98</td>
<td>c</td>
</tr>
<tr>
<td>d</td>
<td>784 + 32</td>
<td>e</td>
<td>316 + 73</td>
<td>f</td>
</tr>
<tr>
<td>=</td>
<td>492</td>
<td>=</td>
<td>771</td>
<td>=</td>
</tr>
<tr>
<td></td>
<td>816</td>
<td></td>
<td>389</td>
<td></td>
</tr>
</tbody>
</table>

6 A website tracked the number of visitors over 5 days:

<table>
<thead>
<tr>
<th></th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
<th>Friday</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>124</td>
<td>199</td>
<td>213</td>
<td>158</td>
<td>236</td>
</tr>
</tbody>
</table>

Use the compensation method to answer the following questions. Try to do the sum in your head, then show how you did it in the space below:

a How many people looked at the website on Monday and Tuesday?

323

b How many people looked at the website on Thursday and Friday?

394

c On which 2 days did the total reach 449 visitors?

Wednesday and Friday
This is a game for 2 players. You will need a counter each, a die and some paper to keep score.

Each of you will choose a starting square on the top row. The object of this game is to get to the finish line first with the largest total.

Roll a die. If you throw:
- a 1 or 2, you can only move one square across the row in either direction;
- a 3 or 4 means you can move one square diagonally;
- a 5 or 6 means you move one downwards.

Add the two numbers using a strategy of your choice. Record your total as you go.

Who will arrive at the finish with the largest score? Good luck!
Try competing with a friend to be the fastest to do all of the sums and work out the names of the three cities.

a 701 + 126 = 827  Letter  Y
501 + 81 = 582  Letter  D
810 + 117 = 927  Letter  E
304 + 205 = 509  Letter  S
810 + 17 = 827  Letter  Y
230 + 626 = 856  Letter  N

The city is  SYDNEY

b 293 + 216 = 509  Letter  S
811 + 111 = 922  Letter  A
650 + 130 = 780  Letter  I
610 + 57 = 667  Letter  P
380 + 32 = 412  Letter  R

The city is  PARIS

c 816 + 40 = 856  Letter  N
913 + 62 = 975  Letter  O
751 + 105 = 856  Letter  N
830 + 79 = 909  Letter  L
882 + 93 = 975  Letter  O
471 + 111 = 582  Letter  D

The city is  LONDON

Code
A = 922
B = 754
C = 141
D = 582
E = 927
F = 735
G = 222
H = 358
I = 780
J = 989
K = 481
L = 909
M = 398
N = 856
O = 975
P = 667
Q = 555
R = 412
S = 509
T = 538
U = 656
V = 1110
W = 1150
X = 716
Y = 827
Z = 1907
Subtraction mental strategies – jump strategy

When we subtract we can use the jump strategy to help us. Look at 189 – 35:

1. First we jump back by the tens.
2. Then we jump back by the units.

\[ 189 - 35 = 154 \]

1. **Warm up with these subtraction wheels:**

\[ 175 - \]

\[ 210 - \]

2. **Use the jump strategy to complete these subtraction problems. The first one has been started for you:**

   a. \( 586 - 55 = \boxed{531} \)
   
   b. \( 388 - 45 = \boxed{343} \)
   
   c. \( 624 - 31 = \boxed{593} \)
   
   d. \( 155 - 95 = \boxed{60} \)
Subtraction mental strategies – jump strategy

Work out the answers to these by using the jump strategy. See if you can do the working in your head:

\[
\begin{align*}
a\, 274 - 30 &= 244 \\
b\, 872 - 61 &= 811 \\
c\, 444 - 50 &= 394 \\
d\, 784 - 61 &= 723 \\
e\, 189 - 35 &= 154 \\
f\, 825 - 60 &= 765
\end{align*}
\]

An electronics store had a sale on the following video games. Use the jump strategy to work out the savings on each item:

- **Bionic Bozo**
  - **Was:** $105
  - **Now:** $75
  - **Save:** $30

- **Revenge of the Ponies**
  - **Was:** $135
  - **Now:** $60
  - **Save:** $75

- **Fitness Frenzy**
  - **Was:** $102
  - **Now:** $91
  - **Save:** $11

- **Taekwondo Team**
  - **Was:** $155
  - **Now:** $111
  - **Save:** $44

Use the prices above and the jump strategy to solve these problems. Show your answer and any working out:

- **a** Tahlia saved her pocket money for weeks to buy Fitness Frenzy. She had $120 saved and bought Fitness Frenzy in the sale. How much money did she have left after the purchase?
  
  $29

- **b** Martin saved up especially for the sale and bought 2 items for $186. He bought Bionic Bozo and which other game?
  
  **Taekwondo Team**

- **c** Dana bought Taekwondo Team for her husband before the sale. What change did she receive if she paid with 2 $100 notes?
  
  $45
Subtraction mental strategies – split strategy

When subtracting large numbers in our heads it can be easier to split the number to be subtracted into parts and work with each part separately.

\[
\begin{align*}
468 - 215 &= 268 - 10 = 258 - 5 = 253 \\
\end{align*}
\]

1 Practise splitting these numbers into hundreds, tens and units. The first one is done for you.

\[
\begin{align*}
a &= 356 = 300 + 50 + 6 \\
b &= 289 = 200 + 80 + 9 \\
c &= 867 = 800 + 60 + 7 \\
d &= 923 = 900 + 20 + 3 \\
e &= 442 = 400 + 40 + 2 \\
f &= 294 = 200 + 90 + 4 \\
\end{align*}
\]

2 Use the split strategy to subtract:

\[
\begin{align*}
a &= 468 - 316 = 468 - 300 = 168 - 10 = 158 - 6 = 152 \\
b &= 574 - 155 = 574 - 100 = 474 - 5 = 419 \\
c &= 457 - 323 = 457 - 300 = 157 - 20 = 137 - 3 = 134 \\
\end{align*}
\]

3 Work out the answers to these questions then cross out the letter above each answer in the puzzle. The letters that remain will form the answer to the riddle.

\[
\begin{align*}
a &= 484 - 74 = 410 \\
b &= 400 - 80 = 320 \\
c &= 406 - 106 = 300 \\
d &= 410 - 40 = 370 \\
e &= 403 - 13 = 390 \\
f &= 455 - 60 = 395 \\
g &= 497 - 92 = 405 \\
h &= 505 - 25 = 480 \\
i &= 520 - 25 = 495 \\
j &= 795 - 150 = 645 \\
k &= 410 - 100 = 310 \\
\end{align*}
\]

Riddle: What is the most rhythmic part of your body? 

\[
\begin{align*}
Y & \quad O & \quad U & \quad R & \quad E & \quad A & \quad R & \quad D & \quad R & \quad U & \quad M
\end{align*}
\]
Subtraction mental strategies – split strategy

These problems have been completed. Are they correct? If not, circle where it all began to go wrong:

a. \[375 - 164 = 211\]
\[\begin{array}{c}
100 \\
60 \\
4 \\
\end{array} \quad \begin{array}{c}
275 \\
215 \\
211 \\
\end{array}
\]
\[375 - 100 = 275\]
\[275 - 60 = 215\]
\[215 - 4 = 211\]
\[\checkmark\]

b. \[429 - 143 = 316\]
\[\begin{array}{c}
100 \\
40 \\
3 \\
\end{array} \quad \begin{array}{c}
323 \\
319 \\
\times\newline\end{array}
\]
\[429 - 100 = 323\]
\[323 - 4 = 319\]
\[319 - 3 = 316\]
\[\times\]

Assuming that each family started their holiday from the same place, work out where each family was at the end of Day 2. Connect the place with the family by drawing a line:

Family | Place
---|---
Robertsons | Damp 'n Crazy Water Park – 726 km
Darnleys | The Big Baboon – 825 km
Pankhursts | Insect Museum – 425 km
Cailes | The Giant Toothbrush – 500 km
Subtraction mental strategies – compensation strategy

Sometimes we round one number in the problem to make it easier to do in our heads. Then we adjust our answer to compensate:

\[
486 - 59 = 427 \\
486 - 60 + 1 = 427 \text{ I rounded up by 1, which means I subtracted 1 extra so we need to add 1 back.}
\]

1. Round these numbers to the closest ten. Then compensate by subtracting or adding to get back to the first number. The first one is done for you.

a. 93 = ________  
   b. 48 = ________  
   c. 52 = ________  
   d. 76 = ________  
   e. 57 = ________  
   f. 37 = ________  
   g. 27 = ________  
   h. 68 = ________

2. Solve these subtraction problems using compensation. Show all your working out:

a. 585 – 78 = ________  
   585 – 80 + 2  
   505 + 2 = 507
   b. 894 – 71 = ________  
   894 – 70 – 1  
   824 – 1 = 823
   c. 163 – 149 = ________  
   163 – 150 + 1  
   13 + 1 = 14

3. Solve these problems using compensation. Decide if you need to round up or down and compensate accordingly:

a. 555 – 63  
   555 – 60 – 3  
   495 – 3  
   = 492
   b. 775 – 98  
   775 – 100 + 2  
   675 + 2  
   = 677
   c. 644 – 139  
   644 – 140 + 1  
   504 + 1  
   = 505

   d. 594 – 329  
   594 – 330 + 1  
   264 + 1  
   = 265
   e. 432 – 204  
   432 – 200 – 4  
   232 – 4  
   = 228
Subtraction mental strategies – compensation strategy

4 Wally the work experience boy has solved these. He is very chuffed because he solved them all correctly. Can you use his working out to establish what the original questions were?

\[
\begin{align*}
\text{a} & \quad 454 - 27 = 427 \\
& \quad 454 - 30 = 424 + 3 = 427 \\
\text{b} & \quad 568 - 308 = 260 \\
& \quad 568 - 310 = 258 + 2 = 260 \\
\text{c} & \quad 994 - 78 = 916 \\
& \quad 994 - 80 = 914 + 2 = 916 \\
\text{d} & \quad 678 - 452 = 226 \\
& \quad 678 - 450 = 228 - 2 = 226 \\
\text{e} & \quad 684 - 59 = 625 \\
& \quad 684 - 60 = 624 + 1 = 625 \\
\text{f} & \quad 348 - 128 = 220 \\
& \quad 348 - 130 = 218 + 2 = 220
\end{align*}
\]

5 Use the compensation method to count backwards and complete these number patterns.

\[
\begin{array}{|c|c|c|c|c|}
\hline
\text{– 17} & \text{– 21} & \text{– 98} & \text{– 33} \\
600 & 124 & 395 & 800 \\
583 & 103 & 297 & 767 \\
566 & 82 & 199 & 734 \\
549 & 61 & 101 & 701 \\
\hline
\end{array}
\]

6 These subtraction problems have been partially solved using compensation. Colour match the steps that were used and complete the missing parts. The first one has been done for you:

\[
\begin{align*}
\$4.50 - \$2.75 \quad & \quad \text{\$5.70 - \$3.00 = \$2.70} \\
\$10.00 - \$6.25 \quad & \quad \text{\$4.50 - \$3.00 = \$1.50} \\
\$5.70 - \$3.05 \quad & \quad \text{\$17.25 - \$13.00 = \$4.25} \\
\$17.25 - \$12.90 \quad & \quad \text{\$9.45 - \$7.00 = \$2.45} \\
\$9.45 - \$6.85 \quad & \quad \text{\$10.00 - \$6.00 = \$4.00} \\
\$4.25 + \_ \text{\$0.15} \quad & \quad \text{\$2.45 + \_ \text{\$0.10} = \$4.35} \\
\$1.50 + \_ \text{\$0.25} \quad & \quad \text{\$4.00 - \_ \text{\$0.25} = \$3.75} \\
\$2.70 - \_ \text{\$0.05} \quad & \quad \text{\$0.15} \quad \text{\$0.10} \quad \text{\$0.25} \quad \text{\$0.25} \quad \text{\$0.05}
\end{align*}
\]
Snakes but no ladders

You can play with 1 to 4 players and you will need two dice and a love of snakes!

Start at 200. Throw the dice and add the numbers. The answer is the number of spaces you can move.

Follow the numbers. If you land on a square with a snake you must work out the answer to the subtraction and move back to that square! The winner is the first to finish ... alive!

<table>
<thead>
<tr>
<th>Finish</th>
<th>263</th>
<th>262 (–25)</th>
<th>261</th>
<th>260</th>
<th>259 (–32)</th>
<th>258</th>
<th>257</th>
<th>256</th>
</tr>
</thead>
<tbody>
<tr>
<td>248</td>
<td></td>
<td>249 (–14)</td>
<td>250</td>
<td>251</td>
<td>252</td>
<td>253 (–50)</td>
<td>254</td>
<td>255 (–17)</td>
</tr>
<tr>
<td>247</td>
<td></td>
<td>246</td>
<td>245</td>
<td></td>
<td>244 (–9)</td>
<td>243</td>
<td>242</td>
<td>241</td>
</tr>
<tr>
<td>232 (–20)</td>
<td>233</td>
<td>234</td>
<td>235</td>
<td></td>
<td>236 (–3)</td>
<td>237</td>
<td>238 (–14)</td>
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<tr>
<td>231</td>
<td></td>
<td>230</td>
<td>229 (–21)</td>
<td>228</td>
<td>227</td>
<td>226 (–11)</td>
<td>225</td>
<td>224</td>
</tr>
<tr>
<td>216 (–8)</td>
<td>217</td>
<td>218</td>
<td>219 (–5)</td>
<td>220 (–17)</td>
<td>221</td>
<td>222</td>
<td>223</td>
<td></td>
</tr>
<tr>
<td>215</td>
<td></td>
<td>214</td>
<td>213 (–10)</td>
<td>212</td>
<td>211</td>
<td>210</td>
<td>209 (–6)</td>
<td>208</td>
</tr>
<tr>
<td>200 Start</td>
<td>201</td>
<td>202</td>
<td>203</td>
<td>204 (–3)</td>
<td>205</td>
<td>206</td>
<td>207</td>
<td></td>
</tr>
</tbody>
</table>
A game of darts is usually scored by subtracting the number that you throw from 301. Throwing darts can be dangerous in a classroom so you will be throwing dice instead!

You can play with 1 - 4 people. You will take turns. You will need a copy of this page, two dice, a pencil and paper to keep score.

Throw two dice, find the total and look for the number in the inner ring. The number next to it in the outer ring is the one that you will subtract from. Start subtracting from 301, keeping score as you go. The winner is the first to get past 0!
How do we add using a written strategy?
First we estimate: $235 + 500 = 735$. Our answer will be around 735.

We start with the units. $5 + 9$ is 14 units. We rename this as 1 ten and 4 units.

We put the 4 in the units column and carry the 1 to the tens column. 3 tens plus 8 tens plus the carried ten is 12 tens.

We rename this as 1 hundred and 2 tens

We put the 2 in the tens column and carry the 1 to the hundreds column.

We add the hundreds. We put 7 in the hundreds column.

Finally we check against our estimate – do they match?

### Solve these addition problems. First estimate the answers:

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>5</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>e:</td>
<td>8</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>b</td>
<td>1</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>e:</td>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>c</td>
<td>3</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>e:</td>
<td>6</td>
<td>0</td>
<td>0</td>
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<tr>
<td>d</td>
<td>1</td>
<td>2</td>
<td>6</td>
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<tr>
<td></td>
<td>+</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>e:</td>
<td>7</td>
<td>0</td>
<td>0</td>
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<tr>
<td>e</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>e:</td>
<td>5</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>f</td>
<td>4</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>1</td>
<td>3</td>
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<tr>
<td>e:</td>
<td>5</td>
<td>8</td>
<td>0</td>
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<tr>
<td>g</td>
<td>5</td>
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<td>1</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>e:</td>
<td>6</td>
<td>5</td>
<td>0</td>
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<tr>
<td>h</td>
<td>3</td>
<td>2</td>
<td>8</td>
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<tr>
<td></td>
<td>+</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>e:</td>
<td>4</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

### Use these cards to make 5 different addition problems using 2 and 3 digit numbers. Show your working out:

<table>
<thead>
<tr>
<th></th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>=</td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Answers will vary.
Written methods – addition

We can also add each place value separately and then add these together:

\[
\begin{align*}
2 + 5 &= 7 \\
60 + 40 &= 100 \\
500 + 100 &= 600 \\
7 + 100 + 600 &= 707
\end{align*}
\]

3 Solve these addition problems using a written strategy of your choice:

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
</tbody>
</table>

4 Can you work out what the missing numbers should be? Remember there may have been some regrouping!

<table>
<thead>
<tr>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

**Guess, check and improve will help me here.**
**Written methods – subtraction**

First we estimate: \( 1000 - 300 = 700 \)

We start with the units. We can’t take 8 away from 4 so we must rename one of the tens as units. We now have 14 units.

14 subtract 8 is 6 so we put the 6 in the units column.

8 tens subtract 7 tens is 1 ten so we put a 1 in the tens column.

We subtract the hundreds. 9 hundred subtract 2 hundred is 7 hundred. Put a 7 in the hundreds column.

We check the answer against our estimate.

---

**Complete the subtraction problems:**

<table>
<thead>
<tr>
<th></th>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a</strong></td>
<td>4 9 7 2</td>
<td>-</td>
<td>1 5 3</td>
<td>4 8 2 9</td>
</tr>
<tr>
<td><strong>b</strong></td>
<td>2 8 14 1</td>
<td>-</td>
<td>8 7 8</td>
<td>2 0 7 3</td>
</tr>
<tr>
<td><strong>c</strong></td>
<td>3 7 16 2</td>
<td>-</td>
<td>5 8 6</td>
<td>3 2 8 6</td>
</tr>
</tbody>
</table>

When a problem asks us to find the difference, we subtract. We always start with the larger number.

---

**Solve these to find the difference problems:**

**a** How far from Showtown to Ringer?

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{U} \\
\hline
7 & 8 & 6 & 9 \\
- & 4 & 1 & 2 & 9 \\
\hline
3 & 7 & 4 & 0 & \text{km} \\
\end{array}
\]

**b** What is the distance from Normanville to Tidings?

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{U} \\
\hline
3 & 2 & 5 & 1 & 2 \\
- & 1 & 2 & 3 & 3 \\
\hline
2 & 0 & 2 & 9 & \text{km} \\
\end{array}
\]

**c** What is the distance from Roper to Eagle Bay?

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{U} \\
\hline
6 & 13 & 1 & 9 \\
- & 5 & 9 & 5 \\
\hline
6 & 8 & 2 & 4 & \text{km} \\
\end{array}
\]

**d** How far from Normanville to Ace Bay?

\[
\begin{array}{c|c|c|c|c}
\text{Th} & \text{H} & \text{T} & \text{U} \\
\hline
3 & 2 & 5 & 1 & 2 \\
- & 1 & 2 & 2 & 6 \\
\hline
2 & 0 & 3 & 6 & \text{km} \\
\end{array}
\]
Written methods – subtraction

3 Use a calculator to add each group of numbers. Turn your calculator upside down to see a word on the screen. Use the key below to help you identify the letters. Write each word in the correct place in the crossword puzzle.

**CLUES**

Across
2. $3025 + 1589 = \underline{4614}$
4. $4456 + 1207 = \underline{5663}$
5. $2776 + 2861 = \underline{5637}$
6. $12824 + 32251 = \underline{45075}$

Down
1. $34569 + 342047 = \underline{376616}$
2. $20786 + 36548 = \underline{57334}$
3. $456789 + 120556 = \underline{577345}$

**Key**

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>E</td>
<td>H</td>
<td>S</td>
<td>G</td>
<td>L</td>
<td>B</td>
</tr>
</tbody>
</table>

4 The answer is 42. What could the missing numbers be? Come up with 5 possibilities:

Answers will vary.
When we add and subtract decimals we follow the same rules we use when working with whole numbers. We need to make sure we line up the place values and the decimal points:

1. Estimate and solve these addition problems. Remember to put the decimal point into your answers:

   |   |   |   |
---|---|---|---|
| a | 5 4 1 | 5 4 1 |
| + | 3 1 3 | + 3 1 3 |
|   | 8 5 4 |   |

   |   |   |   |
---|---|---|---|
| b | 1 3 2 3 | 1 3 2 3 |
| + | 5 8 1 | + 5 8 1 |
|   | 9 0 4 |   |

   |   |   |   |
---|---|---|---|
| c | 4 8 4 | 4 8 4 |
| + | 4 1 3 | + 4 1 3 |
|   | 8 9 7 |   |

   |   |   |   |
---|---|---|---|
| d | 1 2 1 7 8 | 1 2 1 7 8 |
| + | 3 9 3 | + 3 9 3 |
|   | 6 7 1 |   |

2. Estimate and solve these subtraction problems. Remember to put the decimal point into your answers:

   |   |   |   |
---|---|---|---|
| a | 8 4 3 | 8 4 3 |
| − | 3 2 3 | − 3 2 3 |
|   | 5 2 0 |   |

   |   |   |   |
---|---|---|---|
| b | 5 9 1 8 | 5 9 1 8 |
| − | 1 4 0 5 | − 1 4 0 5 |
|   | 5 9 1 5 |   |

   |   |   |   |
---|---|---|---|
| c | 7 5 3 1 3 | 7 5 3 1 3 |
| − | 2 0 4 | − 2 0 4 |
|   | 5 5 9 |   |

   |   |   |   |
---|---|---|---|
| d | 9 6 7 0 | 9 6 7 0 |
| − | 3 2 3 | − 3 2 3 |
|   | 6 4 7 |   |

3. Bart finished his race in a time of 10.67 secs. Lisa finished in 11.24 secs. How much faster was Bart?

   0.57 secs
Written methods – adding and subtracting decimals

You bought the following. Find the difference between the discount price and regular price for each item, then calculate your total savings. Show all your working out:

- **Was** $9.99  
  **Now** $8.50  
  **Save** $1.49

- **Was** $7.35  
  **Now** $6.85  
  **Save** $0.50

- **Was** $8.50  
  **Now** $7.99  
  **Save** $0.51

- **Was** $8.95  
  **Now** $6.50  
  **Save** $2.45

- **Was** $2.89  
  **Now** $1.65  
  **Save** $1.24

- **Was** $4.66  
  **Now** $3.89  
  **Save** $0.77

**Total savings:** $6.96
Written methods – word problems

1 Solve the following word problems using addition or subtraction. Circle the process you use to calculate the answer:

a Joe scored 346 more points than Zac. Joe scored 589 points. How many points did Zac score?

\[
\begin{align*}
\text{Answer} & \quad 243
\end{align*}
\]

b Jenny is 32 cm taller than Jaala. Jaala is 143 cm tall. How tall is Jenny?

\[
\begin{align*}
\text{Answer} & \quad 175 \text{ cm}
\end{align*}
\]

c Maitland recorded 117 mm of rain. Balaklava recorded 58 mm more. How much rain did Balaklava record?

\[
\begin{align*}
\text{Answer} & \quad 175 \text{ mm}
\end{align*}
\]

d Wayne has $17. How much more money does he need to buy a t-shirt that costs $39?

\[
\begin{align*}
\text{Answer} & \quad 22
\end{align*}
\]

e Charlene had $132. After she paid for a ticket, she had $84. How much did the ticket cost?

\[
\begin{align*}
\text{Answer} & \quad 48
\end{align*}
\]

f Sanjay spent $34 and had $92 left. How much did he have before the purchase?

\[
\begin{align*}
\text{Answer} & \quad 126
\end{align*}
\]

g Jarred’s bike cost $189. Molly’s bike cost $263. What is the price difference between the two bikes?

\[
\begin{align*}
\text{Answer} & \quad 74
\end{align*}
\]

h The rainfall in Two Wells was 73 mm. Gawler recorded 36 mm less. How much rainfall did Gawler record?

\[
\begin{align*}
\text{Answer} & \quad 37 \text{ mm}
\end{align*}
\]

i Write your own word problem and solve it.

\[
\begin{align*}
\text{Answer will vary.}
\end{align*}
\]
Slippery dip race

Getting ready

Players 2

Objective To be the first to slide all the way down the slippery dip and land in the sand.

Materials Game marker for each player, scrap paper, pencils, deck of cards with tens and picture cards taken out. Ace has a value of 1.

What to do

To play

1 Mix up the cards and place them face down in a pile.
2 Players place the game markers at the Start.
3 Each player draws 6 cards arranging them to make two 3 digit-numbers. Arrange the cards as shown: Remember, the first card drawn is in the hundreds place for the first number. The fourth card drawn is in the hundreds place for the second number.

4 Add the 2 numbers. The player with the larger total moves the game marker one space down the slippery dip.
5 Play until someone lands in the sand.

Variations Change the number of cards laid out.

---

Answers will vary.
Subtraction puzzles

Puzzle 1
Place the numbers 1 to 6 in the grey circles so that each number is the difference between the two numbers just below it.

```
1 2 3 4 5 6
```

HINT: Place some stickers over a set of counters and write the digits 1 to 8 on each counter. Now you can move them around.

```
THINK
```

Two possibilities are:

```
2
3 5
4 1 6
3
4 1
2 6 5
```

Puzzle 2
Place eight digits from 1 to 8 in each circle. Numbers with a difference of 1 cannot be placed in circles directly connected by a straight line.

```
8 4
1 6 3 7
5 2
```

Sample answer:
Addition mental strategies

1. Complete these addition wheels.

   - **23 +**
     - 20
     - 15
     - 23
     - 58
     - 65
     - 12
     - 49
   
   - **15 +**
     - 25
     - 36
     - 83
     - 56
     - 34
     - 38
     - 14
     - 83
     - 15

2. Show how you would solve 135 + 87 using:

   - **Jump strategy**
   - **Split strategy**
   - **Compensation strategy**

Skills Not yet Kind of Got it

- Calculates basic addition facts
- Demonstrates mental addition strategies for:
  - Jump
  - Split
  - Compensation
Addition mental strategies

1. Complete these addition wheels.

![Addition wheel 1](image1)

![Addition wheel 2](image2)

2. Show how you would solve 135 + 87 using:

   - **Jump strategy**
     
     \[
     135 + 87 = 135 + 80 + 7 = 215 + 7 = 222
     \]

   - **Split strategy**
     
     \[
     135 + 87 = 135 + 90 - 3 = 225 - 3 = 222
     \]

   - **Compensation strategy**
     
     \[
     135 + 87 = 135 + 80 + 7 = 215 + 7 = 222
     \]

Skills

<table>
<thead>
<tr>
<th>Skills</th>
<th>Not yet</th>
<th>Kind of</th>
<th>Got it</th>
</tr>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates mental addition strategies for:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jump</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Split</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compensation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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Series F Topic 1 Assessment
Subtraction mental strategies

1. Complete this subtraction grid:

<table>
<thead>
<tr>
<th>82</th>
<th>34</th>
<th>76</th>
<th>93</th>
<th>100</th>
<th>37</th>
<th>53</th>
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</thead>
<tbody>
<tr>
<td>– 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Show how you would solve 461 – 66 using:

- Jump strategy
- Split strategy
- Compensation strategy

Skills

- Calculates basic subtraction facts
- Demonstrates mental subtraction strategies for:
  - Jump
  - Split
  - Compensation

<table>
<thead>
<tr>
<th>Skills</th>
<th>Not yet</th>
<th>Kind of</th>
<th>Got it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calculates basic subtraction facts</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates mental subtraction</td>
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<tr>
<td>strategies for:</td>
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<tr>
<td>Jump</td>
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<tr>
<td>Split</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Compensation</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Complete this subtraction grid:

<table>
<thead>
<tr>
<th></th>
<th>82</th>
<th>34</th>
<th>76</th>
<th>93</th>
<th>100</th>
<th>37</th>
<th>53</th>
</tr>
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<tbody>
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<td>−18</td>
<td>64</td>
<td>16</td>
<td>58</td>
<td>75</td>
<td>82</td>
<td>19</td>
<td>35</td>
</tr>
</tbody>
</table>

2. Show how you would solve $461 - 66$ using:

- **Jump strategy**

  $461 - 66 \implies 461 - 70 + 4 = 391 + 4 = 395$

- **Split strategy**

  $461 - 66 \implies 401 - 6 = 395$

- **Compensation strategy**

  $461 - 66 \implies 461 - 70 + 4 = 391 + 4 = 395$

Skills Table:

<table>
<thead>
<tr>
<th>Skills</th>
<th>Not yet</th>
<th>Kind of</th>
<th>Got it</th>
</tr>
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<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrates mental subtraction strategies for:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jump □ Split □ Compensation □</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Complete these algorithms. Write an estimate for each:

<table>
<thead>
<tr>
<th>a</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>6</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>+</td>
<td>2</td>
<td>7</td>
<td>6</td>
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</table>

<table>
<thead>
<tr>
<th>b</th>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>3</td>
<td>5</td>
<td>2</td>
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<td>+</td>
<td>3</td>
<td>4</td>
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</table>

<table>
<thead>
<tr>
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<th>Th</th>
<th>H</th>
<th>T</th>
<th>U</th>
</tr>
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<tr>
<td>1</td>
<td>5</td>
<td>6</td>
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<tr>
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<td>Adds and subtracts decimals in an algorithm</td>
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<tr>
<td>Provides a reasonable estimate</td>
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</table>
1. Complete these algorithms. Write an estimate for each:

- **e:** 800
  - a. H T U
  - b. Th H T U
  - c. Th H T U

- **e:** 2000
  - d. Th H T U
  - e. H T U
  - f. Th H T U

- **e:** 110
  - g. H T U T H
  - h. T U T H

- **e:** 5700
  - b. Th H T U
  - c. Th H T U

- **e:** 1800
  - c. Th H T U
  - d. 18 4 0

- **e:** 1000
  - e. H T U
  - f. Th H T U

- **e:** 3300
  - f. Th H T U
  - g. 3 3 0 0

- **e:** 12
  - i. T U T H

Skills

- Solves addition and subtraction problems using a written algorithm
- Adds and subtracts decimals in an algorithm
- Provides a reasonable estimate
## Word problems using addition and subtraction

Name __________________

1. **Read the problems below carefully. Complete each section of each problem. Use any strategy or written method that you find the easiest.**

   **a** Max is reading an exciting book that is 126 pages long. If he has read 48 pages, how many does he have left to read?
   - My estimate: ____________________________
   - My working out: _______________________________
   - What do I need to find out?

   **b** Baz is training for a fun run. On Monday he ran 12 km, Thursday 19 km and on the weekend he ran 22 km. How far did he run altogether?
   - My estimate: ____________________________
   - My working out: _______________________________
   - What do I need to find out?

   **c** Bella went to the shops and bought a magazine for $4.75 and a drink for $2.10. How much change does she get back from $10?
   - My estimate: ____________________________
   - My working out: _______________________________
   - What do I need to find out?

### Skills

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<td>Identifies the question</td>
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<td>Provides a reasonable estimate</td>
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Word problems using addition and subtraction

Read the problems below carefully. Complete each section of each problem. Use any strategy or written method that you find the easiest.

a) Max is reading an exciting book that is 126 pages long. If he has read 48 pages, how many does he have left to read?

My estimate: 76
My working out: 126 – 48
= 126 – 50 + 2
= 78

What do I need to find out?
The pages left to read.

Max has 78 pages left to read.

b) Baz is training for a fun run. On Monday he ran 12 km, Thursday 19 km and on the weekend he ran 22 km. How far did he run altogether?

My estimate: 50 km
My working out:
1 1 2
1 9
+ 2 2
5 3

Total distance.

Baz ran 53 km altogether.

c) Bella went to the shops and bought a magazine for $4.75 and a drink for $2.10. How much change does she get back from $10?

My estimate: $3
My working out: $4.75 + $2.10
= $6.85

$10 – $6.85
= $3.15

The change Bella should get.

Bella gets $3.15 change.

Skills

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<td>Addition mental strategies</td>
<td>Subtraction mental strategies</td>
<td>Written addition and subtraction</td>
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<tr>
<td>NSW</td>
<td>NS3.2 – Selects and applies appropriate strategies for addition and subtraction with counting numbers of any size</td>
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<tr>
<td></td>
<td>• select and apply appropriate mental or written strategies to solve addition and subtraction problems</td>
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<td></td>
<td>• use a formal written algorithm and apply place value concepts to solve addition and subtraction problems</td>
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<td></td>
<td>• use estimation to check solutions</td>
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<td>• add numbers with different numbers of digits</td>
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<td>• check solutions by using inverse operations or a different method (WM)</td>
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<td>• reflect on chosen method of solution of a problem (WM)</td>
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<td>VIC</td>
<td>VELS Number – Level 4</td>
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<td>• explain and use mental and written algorithms for the addition and subtraction of natural numbers</td>
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<td>• use estimates for computations and apply criteria to determine if estimates are reasonable or not</td>
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<td>• calculate whole numbers using addition and subtraction (L3)</td>
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<td>• make problems manageable by using strategies such as estimation and inverse operations</td>
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<td>• interpret and solve problems involving addition and subtraction and mental and written strategies</td>
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<td>SA</td>
<td>3.7</td>
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<td>• describe, represent and analyse operations with rational numbers and relationships between them</td>
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<td>Standards 3-4</td>
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<td>• use secure written methods for addition and subtraction based on sound mental methods</td>
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<td>• begin to focus on effective written methods for calculations with decimals based on established mental methods</td>
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<td>• use a variety of methods to form estimates and make approximations in context</td>
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<td>WA/NT</td>
<td>N.7.3, N.8.3</td>
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<td>• add and subtract whole numbers using mainly mental strategies for additions and subtractions derived readily from basic facts</td>
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<td>• understand the meaning, use and connections between the operations on whole numbers, and use this understanding to choose appropriate operations and construct and complete simple equivalent statements.</td>
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<td>ACT</td>
<td>16.LC.4 operations of addition and subtraction using whole numbers to thousands and decimals to hundredths in familiar contexts</td>
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<td>16.LC.6 inverse operations</td>
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<td>16.LC.20 choose when to use mental computation, written or electronic methods to calculate with numbers and form quick mental estimates to check calculations.</td>
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<td>16.LC.18 explain the calculation approaches they use, compare them with other approaches and check the reasonableness of their answers</td>
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