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Addition mental strategies – number complements

Two numbers that add together are called complements. 12 and 8 are complements to 20 because 12 + 8 = 20. 35 and 65 are complements to 100 because 35 + 65 = 100.

1. Loop the complements in each set:

   a. Complements to 20. There are three to find. The first one has been done for you.

<p>| | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
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<td>10</td>
<td>12</td>
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</tbody>
</table>

   b. Complements to 50. There are eight to find:

<p>| | | | |</p>
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<thead>
<tr>
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<td>33</td>
<td>18</td>
<td>32</td>
<td>10</td>
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</tbody>
</table>

2. Complete these complement webs. Start with the centre number and subtract. Write your answers in the ovals:

   a

   b

3. Show how knowing the complements to 20, 50 and 100 makes adding easier. You may want to loop the complements first. The first one has been done for you.

   a. \(80 + 20 + 15 + 5\) = \(100 + 20 = 120\)

   b. \(18 + 2 + 30 + 20 + 10 + 10\) = ______________________

   c. \(25 + 25 + 40 + 30 + 20 + 10\) = ______________________

   d. \(15 + 35 + 20 + 30 + 10 + 12\) = ______________________
Complete the complements to 50:

4. a  \_ + 38 = 50  
   b  \_ + 17 = 50  
   c 25 + \_ = 50  
   d 32 + \_ = 50  
   e \_ + 46 = 50  
   f \_ + 28 = 50  
   g 14 + \_ = 50  
   h 7 + \_ = 50

Complete the complements to 100:

5. a \_ + 54 = 100  
   b \_ + 22 = 100  
   c \_ + 46 = 100  
   d 33 + \_ = 100  
   e 62 + \_ = 100  
   f 25 + \_ = 100  
   g \_ + 45 = 100  
   h \_ + 48 = 100

Complete the addition crosses where the numbers add to 100 vertically and horizontally. The rules are, they must be symmetrical and only contain multiples of 5.

6. a  
   \_ 25
   45 5 100 5
   \_ 25

b  
   15
   25 100 50
   \_ 25

Addition mental strategies – number complements

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Doubles facts are the same number added together. 

3 + 3 = 6 is the same as saying double 3 is 6.

Near doubles is when you use the doubles fact and then adjust either by adding or subtracting.

See: 6 + 7
Think: double 6 + 1

Circle all the doubles facts. The first two are circled for you. Next, shade all the doubles facts +1, then the double facts –1:

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<tr>
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<td>13</td>
<td>14</td>
<td>15</td>
<td>16</td>
<td>17</td>
<td>18</td>
</tr>
</tbody>
</table>

a  double 1 =

double 2 =
double 3 =
double 4 =
double 5 =
double 6 =
double 7 =
double 8 =
double 9 =

b  double 1 + 1 =
double 2 + 1 =
double 3 + 1 =
double 4 + 1 =
double 5 + 1 =
double 6 + 1 =
double 7 + 1 =
double 8 + 1 =
double 9 + 1 =

 c  double 1 – 1 =
double 2 – 1 =
double 3 – 1 =
double 4 – 1 =
double 5 – 1 =
double 6 – 1 =
double 7 – 1 =
double 8 – 1 =
double 9 – 1 =
Addition mental strategies – doubles and near doubles

2 Complete each near double diagram. Start with the double in the centre and work clockwise. You will need to think in doubles and then adjust.

- \(20 + 22 = \) 
- \(23 + 19 = \) 
- \(20 + 18 = \)

\[ \begin{align*}
\text{a} & : 21 + 19 = \quad 20 + 20 = \quad 20 + 21 = \\
& \quad 20 + 19 = \quad 20 + 18 = \\
& \quad 21 + 22 = \\
\text{b} & : 51 + 47 = \quad 50 + 50 = \quad 50 + 51 = \\
& \quad 53 + 49 = \quad 50 + 47 = \\
& \quad 52 + 49 = \quad 51 + 49 = \\
& \quad 50 + 46 =
\end{align*} \]

3 Show how you would explain to someone how to add each of these using near doubles.

- a 30 + 32
- b 25 + 23
- c 100 + 97
Addition mental strategies – bridge to ten

Bridge to ten is when we count on to the next 10 and then add what is left.

122 + 12 = 134

1 How many to the next ten? The first one has been done for you.

a 145 + 5 → 150
b 243 → 10

c 558 → 10

d 167 → 10

e 346 → 10
f 179 → 10

2 Use the number lines to bridge to ten:

a 253 + 15 = 10
b 464 + 14 = 10
c 671 + 17 = 10
Addition mental strategies – bridge to ten

3 Write a problem that matches the number line:

a  

b  

c  

4 Complete these addition grids by bridging to the next ten in your head:

a  

b  

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Addition mental strategies – jump strategy

When we add, we can use the jump strategy to help us. Look at 57 + 22:
1. First we jump up by the tens.
2. Then we jump up by the ones.

\[ 57 + 22 = 79 \]

**1 Practise jumping in tens along the arrows:**

- a. 12
- b. 53
- c. 123

**2 Use the jump strategy to add these:**

- a. 78 + 52 =
- b. 115 + 44 =
- c. 185 + 63 =
3. Below are some number lines that only show the jumps. Complete the number line for the problem that matches and then write the complete problem.

\[ 187 + 54 \quad 179 + 62 \quad 78 + 53 \]

a. \[ \square + \square = \square \]

b. \[ \square + \square = \square \]

c. \[ \square + \square = \square \]

4. Use the jump strategy to add these:

<table>
<thead>
<tr>
<th></th>
<th>Red velvet</th>
<th>Lemon drop</th>
<th>Coconut</th>
<th>Chocolate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturday</td>
<td>165</td>
<td>82</td>
<td>55</td>
<td>135</td>
</tr>
<tr>
<td>Sunday</td>
<td>43</td>
<td>98</td>
<td>65</td>
<td>36</td>
</tr>
</tbody>
</table>

a. How many red velvet cupcakes were sold over the weekend?

\[ \square + \square = \square \]

b. How many lemon drop and coconut cupcakes were sold on Saturday?

\[ \square + \square = \square \]

c. How many chocolate cupcakes were sold over the weekend?

\[ \square + \square = \square \]
Addition mental strategies – split strategy version 1

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

\[
112 + 46 \quad \rightarrow \quad 112 + 40 = 152 \quad \rightarrow \quad 152 + 6 = 158
\]

1 Practise separating these numbers into tens and ones. The first one has been done for you.

\[
a \quad 48 \quad \leftarrow 40 \quad \rightarrow \quad 8
\]

\[
b \quad 63
\]

\[
c \quad 52
\]

\[
d \quad 27
\]

2 Practise adding the tens to these numbers:

<table>
<thead>
<tr>
<th>+</th>
<th>20</th>
<th>50</th>
<th>30</th>
<th>70</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td>123</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>214</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3 Use the split strategy with these problems. The first one has been done for you.

\[
a \quad 48 + 53 \quad \leftarrow 50 \quad \rightarrow \quad 3
\]

\[
b \quad 65 + 38
\]

\[
c \quad 112 + 25
\]

\[
d \quad 332 + 66
\]
Addition mental strategies – split strategy version 2

Here is another way to use the split strategy.

\[ 42 + 32 = (4 \text{ tens} + 3 \text{ tens}) + (2 \text{ ones} + 2 \text{ ones}) \]
\[ = 7 \text{ tens} + 4 \text{ ones} \]
\[ = 74 \]

1 Use this way to add these:

a) \[ 63 + 37 = (\underline{+} \text{ tens}) + (\underline{+} \text{ ones}) \]
\[ = \underline{+} \text{ tens} + \underline{+} \text{ ones} \]
\[ = \underline{+} \]

b) \[ 88 + 23 = (\underline{+} \text{ tens}) + (\underline{+} \text{ ones}) \]
\[ = \underline{+} \text{ tens} + \underline{+} \text{ ones} \]
\[ = \underline{+} \]

c) \[ 56 + 15 = (\underline{+} \text{ tens}) + (\underline{+} \text{ ones}) \]
\[ = \underline{+} \text{ tens} + \underline{+} \text{ ones} \]
\[ = \underline{+} \]

d) \[ 65 + 28 = (\underline{+} \text{ tens}) + (\underline{+} \text{ ones}) \]
\[ = \underline{+} \text{ tens} + \underline{+} \text{ ones} \]
\[ = \underline{+} \]

Remember:

Ten ones are 1 ten. So if I have 3 tens + 10 ones, I really have 4 tens or 40.

2 Use either version of the split strategy to complete this table:

<table>
<thead>
<tr>
<th>+</th>
<th>23</th>
<th>78</th>
<th>63</th>
<th>55</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Addition mental strategies – applying the split strategy

1. Complete these addition wheels with the split strategy:

![Addition Wheel](image)

2. Record these place value amounts:

   a. 8 tens =  
   b. 17 tens =  
   c. 15 tens =  
   d. 5 ones =  
   e. 12 tens =  
   f. 16 ones =  

3. At circus school, a competition was held to see who could stay on a unicycle the longest. The time was recorded in seconds. Using the split strategy, add up each person’s time. The first one has been done for you.

<table>
<thead>
<tr>
<th>Names</th>
<th>Time in seconds</th>
<th>Working</th>
<th>Total in seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>22, 14, 3</td>
<td>3 tens + 9 ones</td>
<td>39</td>
</tr>
<tr>
<td>b</td>
<td>23, 4, 11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>21, 6, 14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>20, 8, 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e</td>
<td>4, 22, 12</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The winner is: ____________________
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:

\[
23 + 19 = 42
\]

\[
23 + 20 \quad \text{(−1)} \quad \text{I rounded up by 1,}
\]

\[
43 \quad \text{(−1)} = 42 \quad \text{so I subtract 1.}
\]

1 Practise rounding:

a \[148\] → [ ] b \[39\] → [ ] c \[47\] → [ ]

d \[109\] → [ ] e \[96\] → [ ] f \[199\] → [ ]

2 Use the compensation method with these problems. Round the second number up to the closest ten. Compensate by subtracting.

a \[32 + 29\] = [ ]

\[
32 + 30 \quad \text{______} = [ ]
\]

b \[55 + 38\] = [ ]

\[
55 + 40 \quad \text{______} = [ ]
\]

c \[66 + 19\] = [ ]

\[
66 + \text{______} \quad \text{______} = [ ]
\]

d \[22 + 39\] = [ ]

\[
22 + \text{______} \quad \text{______} = [ ]
\]
Addition mental strategies – compensation strategy

3 Now let’s try the compensation method with rounding the second number down. Round these numbers down to the closest ten. Compensate by adding.

- **a** 75 + 22 = 75 + 20 =
- **b** 45 + 41 = 45 + 40 =
- **c** 26 + 32 = 26 + ___ =
- **d** 66 + 53 = 66 + ____ =

When we round down we compensate by adding. When we round up we compensate by subtracting.

4 Use the compensation method to solve this riddle.

What vehicle is spelled the same forwards as it is backwards?

Match the letter to the answer in the grid at the bottom.

- **a** 125 + 48 = A
- **b** 115 + 41 = R
- **c** 55 + 51 = C
- **d** 715 + 28 = E

156 173 106 743 106 173 156
This is a game for two players. Each player will need to copy and cut out the cards on page 15 as well as the game board below.

Each player cuts out a set of the cards. Join both sets and shuffle well. Place face down into one pile in the centre. Each player turns over four of the digit cards and places each digit on their game board. Digit cards can’t be moved once they have been placed.

Players then use a mental strategy to work out the answer and score points according to which category the answer fits into. Some answers may fit into more than one category.

<table>
<thead>
<tr>
<th>Category</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ends in even number</td>
<td>1 point</td>
</tr>
<tr>
<td>Ends in odd number</td>
<td>2 points</td>
</tr>
<tr>
<td>Less than 50</td>
<td>5 points</td>
</tr>
<tr>
<td>Greater than 150</td>
<td>10 points</td>
</tr>
<tr>
<td>Multiple of 5</td>
<td>10 points</td>
</tr>
<tr>
<td>Between 120 and 140</td>
<td>5 points</td>
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<tr>
<td></td>
<td></td>
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<td>---</td>
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Subtraction mental strategies – addition and subtraction

Knowing one addition fact means you also know two related subtraction facts.
Because $7 + 3 = 10$ you know that $10 - 7 = 3$ and $10 - 3 = 7$

1. Make a group of facts for each pair of numbers. The first one has been done for you.

   a. \[
   \begin{array}{c|c}
   15 & 35 \\
   \hline
   15 + 35 & = 50 \\
   50 - 15 & = 35 \\
   50 - 35 & = 15 \\
   \end{array}
   \]

   b. \[
   \begin{array}{c|c}
   45 & 55 \\
   \hline
   \end{array}
   \]

   c. \[
   \begin{array}{c|c}
   73 & 27 \\
   \hline
   \end{array}
   \]

   d. \[
   \begin{array}{c|c}
   105 & 15 \\
   \hline
   \end{array}
   \]

   e. \[
   \begin{array}{c|c}
   120 & 10 \\
   \hline
   \end{array}
   \]

   f. \[
   \begin{array}{c|c}
   135 & 10 \\
   \hline
   \end{array}
   \]

2. Complete each number trail:

   a. \[
   \begin{array}{c|c|c|c|c|c}
   150 & +10 & \rightarrow & -15 & \rightarrow & +50 & \rightarrow & +30 \\
   \hline
   \end{array}
   \]

   b. \[
   \begin{array}{c|c|c|c|c|c}
   200 & -50 & \rightarrow & +25 & \rightarrow & -30 & \rightarrow & +55 \\
   \hline
   \end{array}
   \]

   c. \[
   \begin{array}{c|c|c|c|c|c}
   99 & +11 & \rightarrow & +50 & \rightarrow & +50 & \rightarrow & -20 \\
   \hline
   \end{array}
   \]

   d. \[
   \begin{array}{c|c|c|c|c|c}
   76 & +24 & \rightarrow & +35 & \rightarrow & +15 & \rightarrow & -25 \\
   \hline
   \end{array}
   \]
Subtraction mental strategies – subtraction strategy review

Look for patterns:  
- \(6 - 2 = 4\) so \(60 - 20 = 40\) and \(600 - 200 = 400\)
- \(72 - 9 = 63\) so \(62 - 9 = 53\) and \(52 - 9 = 43\)

Count on: When numbers are close together, you can count on to find the difference.

Count on:

Complements:
- \(35 + 65 = 100\) so \(100 - 35 = 65\)
- \(12 + 8 = 20\) so \(20 - 8 = 12\)

Near doubles:
- See: \(15 - 7\) Think: \((14 - 7) + 1\)

1. This hundred grid makes it easier to see subtraction patterns. Use it to complete the sets.

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<td>82</td>
<td>83</td>
<td>84</td>
<td>85</td>
<td>86</td>
<td>87</td>
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<td>89</td>
<td>90</td>
</tr>
<tr>
<td>90</td>
<td>91</td>
<td>92</td>
<td>93</td>
<td>94</td>
<td>95</td>
<td>96</td>
<td>97</td>
<td>98</td>
<td>99</td>
<td>100</td>
</tr>
</tbody>
</table>

Set 1:  
- \(17 - 9 = \) 
- \(27 - 9 = \) 
- \(37 - 9 = \) 
- \(47 - 9 = \) 
- \(57 - 9 = \)

Set 2:  
- \(21 - 6 = \) 
- \(31 - 6 = \) 
- \(41 - 6 = \) 
- \(51 - 6 = \) 
- \(61 - 6 = \) 
- \(71 - 6 = \)

2. Extend these subtractions according to the patterns:

<table>
<thead>
<tr>
<th></th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>(9 - 6 = )</td>
<td>(90 - 60 = )</td>
<td>(900 - 600 = )</td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>(14 - 8 = )</td>
<td>(140 - 80 = )</td>
<td>(1400 - 800 = )</td>
<td></td>
</tr>
<tr>
<td>c</td>
<td>(24 - 14 = )</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>(69 - 32 = )</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Subtraction mental strategies – subtraction strategy review

3 Use counting on to complete these:

a) $32 - 29 = \boxed{3}$
b) $33 - 28 = \boxed{5}$
c) $34 - 27 = \boxed{7}$
d) $71 - 68 = \boxed{3}$
e) $82 - 76 = \boxed{6}$
f) $73 - 69 = \boxed{4}$
g) $83 - 77 = \boxed{6}$
h) $112 - 109 = \boxed{3}$
i) $201 - 196 = \boxed{5}$

4 Complete these function tables using counting on:

- **a**
  - In: 120, 123, 126, 124
  - Rule: $\boxed{-118}$
  - Out: \[
  \begin{array}{|c|c|}
  \hline
  \text{In} & \text{Out} \\
  \hline
  120 & \boxed{\phantom{120}} \\
  123 & \boxed{\phantom{120}} \\
  126 & \boxed{\phantom{120}} \\
  124 & \boxed{\phantom{120}} \\
  \hline
  \end{array}
  \]

- **b**
  - In: 102, 104, 108, 101
  - Rule: $\boxed{-96}$
  - Out: \[
  \begin{array}{|c|c|}
  \hline
  \text{In} & \text{Out} \\
  \hline
  102 & \boxed{\phantom{102}} \\
  104 & \boxed{\phantom{102}} \\
  108 & \boxed{\phantom{102}} \\
  101 & \boxed{\phantom{102}} \\
  \hline
  \end{array}
  \]

- **c**
  - In: 87, 81, 85, 83
  - Rule: $\boxed{-78}$
  - Out: \[
  \begin{array}{|c|c|}
  \hline
  \text{In} & \text{Out} \\
  \hline
  87 & \boxed{\phantom{87}} \\
  81 & \boxed{\phantom{87}} \\
  85 & \boxed{\phantom{87}} \\
  83 & \boxed{\phantom{87}} \\
  \hline
  \end{array}
  \]

5 Complete this cross number puzzle. Using complements to 100 will help.

Across

1. $100 - 80 = \boxed{20}$
2. $100 - 89 = \boxed{11}$
3. $100 - 5 = \boxed{95}$
4. $100 - 28 = \boxed{72}$
5. $100 - 22 = \boxed{78}$
6. $100 - 64 = \boxed{36}$
7. $100 - 49 = \boxed{51}$
8. $100 - 61 = \boxed{39}$
9. $100 - 52 = \boxed{48}$
10. $100 - 75 = \boxed{25}$
11. $100 - 66 = \boxed{34}$
12. $100 - 75 = \boxed{25}$

Down

1. $100 - 78 = \boxed{22}$
2. $100 - 88 = \boxed{12}$
3. $100 - 2 = \boxed{98}$
4. $100 - 24 = \boxed{76}$
5. $100 - 29 = \boxed{71}$
6. $100 - 11 = \boxed{89}$
7. $100 - 62 = \boxed{38}$
8. $100 - 46 = \boxed{54}$
9. $100 - 65 = \boxed{35}$
Subtraction mental strategies – subtraction strategy review

6 Use your knowledge of doubles and near doubles to complete these subtraction tables. The first one in each has been done for you.

<table>
<thead>
<tr>
<th></th>
<th>See</th>
<th>Think</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>19 – 9 =</td>
<td>(18 – 9) + 1</td>
</tr>
<tr>
<td></td>
<td>201 – 100 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>141 – 70 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>71 – 35 =</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>See</th>
<th>Think</th>
</tr>
</thead>
<tbody>
<tr>
<td>b</td>
<td>15 – 8 =</td>
<td>(16 – 8) – 1</td>
</tr>
<tr>
<td></td>
<td>31 – 16 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>99 – 50 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>87 – 44 =</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>See</th>
<th>Think</th>
</tr>
</thead>
<tbody>
<tr>
<td>c</td>
<td>26 – 12 =</td>
<td>(24 – 12) + 2</td>
</tr>
<tr>
<td></td>
<td>52 – 25 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>68 – 33 =</td>
<td></td>
</tr>
<tr>
<td></td>
<td>104 – 51 =</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>See</th>
<th>Think</th>
</tr>
</thead>
<tbody>
<tr>
<td>d</td>
<td>24 – 13 =</td>
<td>(26 – 13) – 2</td>
</tr>
<tr>
<td></td>
<td>48 – 25 =</td>
<td></td>
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<tr>
<td></td>
<td>70 – 36 =</td>
<td></td>
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<tr>
<td></td>
<td>78 – 40 =</td>
<td></td>
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</tbody>
</table>

7 Complete this near double web, which is based on the subtraction double in the centre. Start in the centre and work clockwise:

Start by looking at the first number. For 99 – 51, think 100 – 50 subtract 2 = 48.
Subtraction mental strategies – jump strategy

When we subtract, we can use the jump strategy to help us. Look at 99 – 42:

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

\[ 99 - 42 = 57 \]

1. Solve these using the jump strategy:

   a. \( 125 - 42 = \) 

   b. \( 168 - 36 = \) 

   c. \( 335 - 54 = \) 

   d. \( 245 - 45 = \)
Subtraction mental strategies – jump strategy

2 It’s inventory time at the Candilicious candy shop. Use the jump strategy to work out how many of each type of candy has been sold.

<table>
<thead>
<tr>
<th>Candy</th>
<th>Started with</th>
<th>Amount left</th>
<th>Sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cinnamon drops</td>
<td>254</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Caramel melts</td>
<td>186</td>
<td>58</td>
<td></td>
</tr>
<tr>
<td>Jubes</td>
<td>145</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>Chocolate buds</td>
<td>165</td>
<td>34</td>
<td></td>
</tr>
</tbody>
</table>

a  Cinnamon drops

\[ \begin{array}{c}
\text{254} \\
\text{45}
\end{array} = \begin{array}{c}
\text{?}
\end{array} \]

b  Caramel melts

\[ \begin{array}{c}
\text{186} \\
\text{58}
\end{array} = \begin{array}{c}
\text{?}
\end{array} \]

c  Jubes

\[ \begin{array}{c}
\text{145} \\
\text{65}
\end{array} = \begin{array}{c}
\text{?}
\end{array} \]

d  Chocolate buds

\[ \begin{array}{c}
\text{165} \\
\text{34}
\end{array} = \begin{array}{c}
\text{?}
\end{array} \]
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.

\[
255 - 132 \rightarrow 255 - 100 = 155 \rightarrow 155 - 30 = 125 \rightarrow 125 - 2 = 123
\]

\[
255 - 132 = 123
\]

1. Practise splitting numbers into hundreds, tens and ones:

   a. 482
   b. 675
   c. 732
   d. 834

2. Complete these subtraction trails:

   a. 768
      \[\begin{array}{c}
      -200 \\
      -20 \\
      -300 \\
      -10
      \end{array}\]

   b. 463
      \[\begin{array}{c}
      -100 \\
      -50 \\
      -20 \\
      -50
      \end{array}\]

3. Use the split strategy with these problems:

   a. 456 - 212
      \[\begin{array}{c}
      -200 \\
      \_\_\_ - 10 \\
      \_\_\_ - 2
      \end{array}\]
      So, 456 - 212 = __________

   b. 378 - 165
      \[\begin{array}{c}
      -100 \\
      \_\_\_ - 60 \\
      \_\_\_ - 5
      \end{array}\]
      So, 378 - 165 = __________
Subtraction mental strategies – split strategy

4 Try these subtractions with the split strategy:

a \[479 - 45 = \quad \]

\[\text{So, } 479 - 45 = \quad \]

b \[834 - 21 = \quad \]

\[\text{So, } 834 - 21 = \quad \]

c \[637 - 312 = \quad \]

\[\text{So, } 637 - 312 = \quad \]

d \[567 - 232 = \quad \]

\[\text{So, } 567 - 232 = \quad \]

5 Solve these pyramid puzzles using any strategy you like. The two bricks add to support the number on top. For example in puzzle a, \(22 + 23 = 45\).

a

\[
\begin{array}{c}
\text{175} \\
\text{45} \\
\text{22} \quad \text{23}
\end{array}
\]

b

\[
\begin{array}{c}
\text{370} \\
\text{135} \\
\text{80} \quad \text{55}
\end{array}
\]

c

\[
\begin{array}{c}
\text{220} \\
\text{95} \\
\text{40}
\end{array}
\]

d

\[
\begin{array}{c}
\text{530} \\
\text{280} \\
\text{120}
\end{array}
\]
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:

\[
125 - 49 = 76
\]

\[
125 - 50 + 1 = 76
\]

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 show how you rounded by subtracting or adding the difference. The first one has been done for you.

\[a \quad 78 = \underline{80} - 2\]
\[b \quad 59 = \underline{\quad \quad \quad} \quad \quad c \quad 62 = \underline{\quad \quad \quad} \]
\[d \quad 23 = \underline{\quad \quad \quad} \quad \quad e \quad 87 = \underline{\quad \quad \quad} \quad \quad f \quad 99 = \underline{\quad \quad \quad} \]
\[g \quad 103 = \underline{\quad \quad \quad} \quad \quad h \quad 21 = \underline{\quad \quad \quad} \quad \quad i \quad 88 = \underline{\quad \quad \quad} \]

2 Solve these subtraction problems using compensation. Show your working.

\[a \quad 136 - 29 = \underline{\quad \quad \quad} \quad \quad b \quad 145 - 38 = \underline{\quad \quad \quad} \]
\[136 - 30 + 1 \quad \quad \quad 145 - 40 + 2 \]
\[\underline{\quad \quad \quad} = \underline{\quad \quad \quad} \quad \quad \quad \underline{\quad \quad \quad} = \underline{\quad \quad \quad} \]

\[c \quad 156 - 39 = \underline{\quad \quad \quad} \quad \quad d \quad 184 - 48 = \underline{\quad \quad \quad} \]
\[156 - \underline{\quad \quad \quad} \quad \quad 184 - \underline{\quad \quad \quad} \]
\[\underline{\quad \quad \quad} = \underline{\quad \quad \quad} \quad \quad \quad \underline{\quad \quad \quad} = \underline{\quad \quad \quad} \]

Continued on page 25.
2 Solve these subtraction problems using compensation. Show your working.

- **e**  \[ 145 - 29 = \boxed{136} \]
  \[ 145 - 30 = \boxed{115} \]

- **f**  \[ 176 - 69 = \boxed{107} \]
  \[ 176 - 40 = \boxed{136} \]

- **g**  \[ 365 - 42 = \boxed{323} \]
  \[ 365 - 40 = \boxed{325} \]

- **h**  \[ 250 - 32 = \boxed{218} \]
  \[ 250 - 40 = \boxed{210} \]

3 Answer these subtraction problems to solve the riddle below:

What swirls, loops, and circles on your fingertips, yet never moves?

- **a**  \[ 65 - 29 = F \]
- **b**  \[ 145 - 32 = U \]
- **c**  \[ 175 - 61 = E \]
- **d**  \[ 86 - 59 = O \]
- **e**  \[ 180 - 48 = I \]
- **f**  \[ 150 - 32 = N \]
- **g**  \[ 96 - 42 = R \]
- **h**  \[ 75 - 33 = G \]
- **i**  \[ 155 - 49 = Y \]
- **j**  \[ 166 - 55 = P \]
- **k**  \[ 185 - 19 = T \]
- **l**  \[ 370 - 28 = S \]
This is a game for two players. You will need a copy of this page and 25 counters between you.

Player 1 covers a number on the grid with a counter and subtracts this number from 100. Player 2 then covers a number on the grid with a counter and subtracts this number from Player 1’s answer. Play continues until a player is able to pick one of the remaining uncovered numbers to equal zero. If play continues without anyone reaching zero, the lowest difference wins.

Sample game:
Player 1 covers 20 with a counter and states the subtraction fact: 100 – 20 = 80
Player 2 covers 30 with a counter and states the next subtraction fact: 80 – 30 = 50
Player 1 then covers 50 and reaches zero first, so wins the round.
### Subtraction grid puzzles

Complete these subtraction cross number puzzles:

#### a

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>−</td>
<td>75</td>
</tr>
<tr>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>53</td>
<td>−</td>
<td>= 14</td>
</tr>
<tr>
<td>−</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>−</td>
<td>36</td>
<td>=</td>
</tr>
</tbody>
</table>

#### b

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>350</td>
<td>−</td>
<td>228</td>
</tr>
<tr>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>165</td>
<td>−</td>
<td>= 54</td>
</tr>
<tr>
<td>=</td>
<td>=</td>
<td></td>
</tr>
<tr>
<td>−</td>
<td>117</td>
<td>=  68</td>
</tr>
</tbody>
</table>
Written methods – 3 digit addition with regrouping

This is the written method for addition when regrouping.
First, estimate the answer to the nearest ten:
530 + 200 = 730
Add the ones: 4 + 7 = 11 ones.
Think of this as 1 ten and 1 one.
Write the 1 in the ones column and put the 1 in the tens column.
Add the tens: 3 + 9 + 1 = 13 tens.
Write 3 in the tens column and 1 in the hundreds column.
Add the hundreds: 5 + 1 + 1 = 7 hundreds.
Is our answer reasonable? Yes, because it’s close to our estimate.

1 Practise estimating answers by rounding to the nearest ten. The first one has been done for you.

<table>
<thead>
<tr>
<th>Question</th>
<th>Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>a 682 + 179</td>
<td>680 + 180 = 860</td>
</tr>
<tr>
<td>b 271 + 119</td>
<td></td>
</tr>
<tr>
<td>c 359 + 222</td>
<td></td>
</tr>
<tr>
<td>d 378 + 119</td>
<td></td>
</tr>
<tr>
<td>e 587 + 398</td>
<td></td>
</tr>
<tr>
<td>f 412 + 98</td>
<td></td>
</tr>
<tr>
<td>g 189 + 108</td>
<td></td>
</tr>
<tr>
<td>h 911 + 207</td>
<td></td>
</tr>
</tbody>
</table>

2 Add these 3 digit numbers using the written method. First, estimate to the nearest ten.

<table>
<thead>
<tr>
<th>e:</th>
<th>e:</th>
<th>e:</th>
</tr>
</thead>
<tbody>
<tr>
<td>H  T  O</td>
<td>H  T  O</td>
<td>H  T  O</td>
</tr>
<tr>
<td>3 5 4</td>
<td>6 2 8</td>
<td>3 6 4</td>
</tr>
<tr>
<td>+ 2 1 7</td>
<td>+ 2 1 3</td>
<td>+ 2 2 8</td>
</tr>
</tbody>
</table>

Continued on page 29.
Written methods – 3 digit addition with regrouping

Continued from page 28.

2 Add these 3 digit numbers using the written method:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>T</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>d</td>
<td>2</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>+</td>
<td>1</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<td>H</td>
<td>T</td>
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<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>+</td>
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<td>9</td>
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<td>f</td>
<td>2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>+</td>
<td>2</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

3 Solve these word problems using the written method:

a  At a muffin shop, 456 banana muffins were sold on Saturday and 458 caramel muffins were sold on Sunday. How many muffins were sold that weekend?

b  A train left the station with 389 people on board and then another 678 people got on over the next three stops. How many passengers were on the train altogether?
## Written methods – 3 digit subtraction with regrouping

1. Subtract these 3 digit numbers using the written method. Start by writing your estimate. Estimate to the nearest 10.

<table>
<thead>
<tr>
<th></th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
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<td>2</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b</td>
<td>7</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td>9</td>
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<tr>
<td>c</td>
<td>5</td>
<td>9</td>
<td>2</td>
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<td>f</td>
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<td>g</td>
<td>8</td>
<td>8</td>
<td>2</td>
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<td></td>
<td>6</td>
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</tbody>
</table>

You can use a piece of scrap paper to estimate your answer to the nearest 10.
This sign shows the distances of towns along a highway from where the sign is. Find the difference between these places.

Find the difference means to subtract.

a. What is the distance between Ringer and Normanville?

```
   H T O
  __________
     -
  __________
       km
```

b. What is the distance between Roper and Eagle Bay?

```
   H T O
  __________
     -
  __________
       km
```

c. What is the distance between Showtown and Ringer?

```
   H T O
  __________
     -
  __________
       km
```

d. What is the distance between Roper and Normanville?

```
   H T O
  __________
     -
  __________
       km
```
Written methods – 4 digit addition

1. Add these 4 digit numbers:

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
</table>
   a  | 3 | 3 | 5 | 3 |
   b  | 2 | 5 | 4 | 6 |
   c  | 4 | 5 | 2 | 4 |
   +  | 1 | 0 | 2 | 1 |
   +  | 5 | 4 | 3 | 1 |
   +  | 2 | 1 | 6 | 4 |

2. Add these 4 digit numbers by regrouping:

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
</table>
   a  | 6 | 6 | 3 | 8 |
   b  | 4 | 2 | 4 | 5 |
   c  | 3 | 4 | 2 | 9 |
   +  | 1 | 2 | 3 | 6 |
   +  | 2 | 5 | 1 | 7 |
   +  | 1 | 1 | 3 | 9 |

3. Add these 4 digit numbers by regrouping:

<table>
<thead>
<tr>
<th>Th</th>
<th>H</th>
<th>T</th>
<th>O</th>
</tr>
</thead>
</table>
   a  | 2 | 4 | 6 | 6 |
   b  | 3 | 1 | 8 | 7 |
   c  | 3 | 2 | 9 | 6 |
   +  | 2 | 1 | 8 | 7 |
   +  | 3 | 0 | 5 | 9 |
   +  | 2 | 1 | 5 | 8 |
Written methods – addition and subtraction challenges

1 Write the numbers which are above each problem in the correct place:

a  
\[
\begin{array}{ccc}
4 & 3 & 9 \\
3 & 6 & 2 \\
+ & 7 \\
\hline
7 & 9 \\
\end{array}
\]

b  
\[
\begin{array}{ccc}
8 & 3 & 3 & 2 \\
6 & 5 \\
- & 4 \\
\hline
4 & 3 \\
\end{array}
\]

c  
\[
\begin{array}{ccc}
6 & 5 & 1 \\
3 \\
+ & 2 & 3 \\
\hline
8 & 4 & 8 \\
\end{array}
\]

d  
\[
\begin{array}{ccc}
3 & 6 & 7 \\
5 \\
- & 2 & 4 \\
\hline
2 & 4 & 3 \\
\end{array}
\]

2 Solve these. The same symbol means the same number.

a  
\[
\begin{array}{ccc}
\blacklozenge & 3 & \blacklozenge \\
+ & \blacklozenge & \blacklozenge & 4 \\
\hline
1 & 0 & 8 & 9 \\
\blacklozenge & = \,
\end{array}
\]

b  
\[
\begin{array}{ccc}
6 & 2 & 9 \\
+ & \heartsuit & 1 & \heartsuit \\
\hline
1 & 1 & 4 & 4 \\
\heartsuit & = \,
\end{array}
\]

c  
\[
\begin{array}{ccc}
\star & 8 & \star \\
- & 3 & \star & 2 \\
\hline
1 & \star & 2 \\
\star & = \,
\end{array}
\]

d  
\[
\begin{array}{ccc}
\smiley & 4 & 1 \\
- & 2 & 3 & \smiley \\
\hline
3 & 0 & 6 \\
\smiley & = \,
\end{array}
\]
This is a game for four players. Each player will need to copy and cut out the digit cards below. They will also need the addition frame on this page and a piece of scrap paper to write the answer on.

Choose one person to be the caller. This person calls out the single digits above, randomly one at a time. The other players place the digits in a box in the frame below, in any order. Players must think carefully about which square to place the digit, in order to create the largest total.

When all the players have filled in the frame, they complete the addition. The highest answer scores a point. Play the best out of 5.
This is a game for two players. Each player will need to copy and cut out the digit cards. To play you need to share the number grid on this page. Each player should have a piece of scrap paper to write the answer on and three counters in the same colour, but different to the other player.

The aim of the game is to claim any 3 numbers on the grid below. Each player lays their digit cards upside down in front of them. They then turn over four of the cards to form two 2 digit numbers and find the difference.

If the answer is on the grid, they claim it by placing a counter on the number. If it’s not, they can have a chance at rearranging the four cards they turned over, to create a number on the grid. If they can’t do this, it’s the next player’s turn.
Money – coin combinations

It is important that you are able to recognise these bills and coins so that you are able to spend and save your money wisely.

Calculate the total of each group of cash:

1. Calculate the total of each group of cash:

   a. [Picture of bills and coins]
   b. [Picture of bills and coins]
   c. [Picture of coins]
   d. [Picture of coins and bills]
Money – coin combinations

2 Make up each amount below using bills and coins in two different ways:

a  Show $20:

b Show $50:

c Show $100:
Money – finding change

When you buy something and you don’t have the exact combination of bills and coins, you can pay with a larger amount and get the difference back. This is called change.

If I paid for these flowers with $20, my change would be $8.

Find the change for each amount below. You could bridge to the next dollar and count on or use a written subtraction. Show all your workings:

1. a I had $100. I spent $68.
   
   Change =

   b I had $50. I spent $22.
   
   Change =

2. c I had $20. I spent $16.50.
   
   Change =

   d I had $120. I spent $60.
   
   Change =

3. e I had $100. I spent $75.
   
   Change =

   f I had $50. I spent $42.
   
   Change =
Money – using money

When you plan a party, you usually buy things such as food, drink and party favours. It’s a good idea to set a budget before you go shopping so that you don’t spend too much.

1 Here is a price list of party items:

<table>
<thead>
<tr>
<th>Food</th>
<th></th>
<th>Drink</th>
<th></th>
<th>Party favours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sausage rolls</td>
<td>$3.20</td>
<td>Orange juice</td>
<td>$2.75</td>
<td>10 party hats</td>
</tr>
<tr>
<td>Pizza slices</td>
<td>$8.95</td>
<td>Lemonade</td>
<td>$3.10</td>
<td>10 balloons</td>
</tr>
<tr>
<td>Burgers</td>
<td>$7.65</td>
<td>Cola</td>
<td>$3.25</td>
<td>4 game prizes</td>
</tr>
</tbody>
</table>

a Which two items of food and drink could I buy for less than $10? Show the change.

Change =

b Maxine bought a type of party food. If her change was $2.35 and she paid with a $10 bill, what did she buy?

Heidi’s shopping list:

2 packs of sausage rolls ..
4 packs of pizza slices .....
10 party hats ............
20 balloons ..............
Orange juice ...............
Lemonade....................

Total .................

c Look at the price lists for the party items at the top of this page. Use a calculator to add up the total amount on Heidi’s shopping list.

d Heidi’s budget is $50. Suggest something to take off the total.
The aim of the game is to end up with the most amount of money at the end of each round.

Roll the die to find what you are calculating change for. Record the number you rolled and the change in the table. Take turns. When you have filled in the table for each round, calculate the total amount of change. The most change scores 5 points. Play for three rounds to decide the overall winner.

### Die number

<table>
<thead>
<tr>
<th>Die number</th>
<th>Amount you have</th>
<th>Amount you spend</th>
</tr>
</thead>
<tbody>
<tr>
<td>⚪</td>
<td>$20</td>
<td>It’s your friend’s birthday, you spend $5.25 on a card.</td>
</tr>
<tr>
<td>⚪ ⚪</td>
<td>$15</td>
<td>You spend $7.50 on school supplies.</td>
</tr>
<tr>
<td>⚪ ⚪ ⚪ ⚪</td>
<td>$5</td>
<td>You buy some lollies for $3.85.</td>
</tr>
<tr>
<td>⚪ ⚪ ⚪ ⚪ ⚪</td>
<td>$5</td>
<td>You spend $4.25 downloading songs from the internet.</td>
</tr>
<tr>
<td>⚪ ⚪ ⚪ ⚪ ⚪</td>
<td>$10</td>
<td>A trip to the movies costs $7.80.</td>
</tr>
<tr>
<td>⚪ ⚪ ⚪ ⚪ ⚪ ⚪</td>
<td>$20</td>
<td>You are fined $17.80 for littering.</td>
</tr>
</tbody>
</table>
### Calculate the change

#### Round 1

<table>
<thead>
<tr>
<th>Number rolled</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total**

#### Round 2

<table>
<thead>
<tr>
<th>Number rolled</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total**

#### Round 3

<table>
<thead>
<tr>
<th>Number rolled</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total**