Mathletics
(D) Student $\square$

5 ¢7 - 12 5+7 = 12

## Addition and Subtraction



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## Series D - Addition and Subtraction

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## Series Author:

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## Addition mental strategies - look for a ten

1 Let's warm up with some addition grids. Write these answers as fast as you can by counting on:
a

| + | 2 | 3 | 0 |
| :---: | :---: | :---: | :---: |
| 6 |  |  |  |
| 17 |  |  |  |
| 13 |  |  |  |
| 12 |  |  |  |

b

| + | 3 | 0 | 2 |
| :---: | :---: | :---: | :---: |
| 9 |  |  |  |
| 16 |  |  |  |
| 11 |  |  |  |
| 14 |  |  |  |

c

| + | 2 | 3 | 0 |
| :---: | :---: | :---: | :---: |
| 7 |  |  |  |
| 13 |  |  |  |
| 8 |  |  |  |
| 5 |  |  |  |

2 Adding more than two numbers together is easier if we look for a ten. Circle the numbers that add to 10 first, then add what is left:
a

b

| 1 | 5 | 5 |
| :--- | :--- | :--- |

$\square$
c

| 9 | 5 | 1 |
| :--- | :--- | :--- |$=$

e

| 5 | 6 | 4 |
| :--- | :--- | :--- |

d

f

| 2 | 1 | 8 |
| :--- | :--- | :--- |

3 Loop the numbers that make 10. Look for sets going across and down. One set has been looped for you. How many more can you find?


4 Look for a ten and change the order of the numbers in each addition problem to make it faster to add.
$a 4+5+3+5+6$
b $9+3+7+1+5$
$=\square$


## Addition mental strategies - look for patterns

Number patterns are useful. You can build on basic addition facts.

1. Add $\mathbf{1 0}$ each time:
a

| 10 |  |  |  |
| :--- | :--- | :--- | :--- |

b

| 15 |  |  |  |
| :--- | :--- | :--- | :--- |

c

| 7 |  |  |  |
| :--- | :--- | :--- | :--- |

2 Add $\mathbf{1 0 0}$ each time:
a

| 10 |  |  |  |
| :--- | :--- | :--- | :--- |

b

| 15 |  |  |  |
| :--- | :--- | :--- | :--- |

c

| 7 |  |  |  |
| :--- | :--- | :--- | :--- |

3 Use patterns to complete this addition table:

| a | $3+5=$ | $30+50=$ | $300+500=$ |
| :---: | :---: | :---: | :---: |
| b | $6+2=$ | $60+20=$ | $600+200=$ |
| c | $4+1=$ | $40+10=$ | $400+100=$ |
| d | $7+3=$ | $70+30=$ | $700+300=$ |

4. Complete this addition trail:


## Addition mental strategies - doubles and near doubles

Doubles facts are the same number added together.

$$
3+3=6 \text { is the same as saying double } 3 \text { is } 6
$$

1 Write a doubles fact to match each picture:
a Double the fingers:
 If I double $\square$ I will get $\square$
b Double the pencils:
 If I double $\square$ I will get $\square$
c Double the spots:
 If I double $\square$ I will get $\square$ d Double the lace holes: If I double $\square$ I will get

$\square$

2 Use these addition frames to double each of these numbers as quickly as you can:


3 Complete the grid below so that the question in the top row matches the answer in the bottom row. The first one has been done for you.

| $2+2$ |  | $3+3$ | $4+4$ |  |  | $7+7$ | $8+8$ |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| $=4$ | $=10$ |  |  | $=2$ | $=12$ |  |  | $=18$ |

Once you know your basic double facts, you can use them to double bigger numbers e.g. $12+12=20+4=24$

4 Double these:
a $10 \rightarrow$ $\square$
b $12 \rightarrow$ $\square$
c $16 \rightarrow$ $\square$
d $\square$


## Addition mental strategies - doubles and near doubles

Near doubles strategy is when you double a number and adjust.

See: $5+6$
Think: double $5+1=11$

See: $7+6$
Think: double $7-1=13$

5 Complete the near double strategy for these. The first one has been done for you.
a $2+3$ = double $2+1=5$
b $4+5=$ double $4+1=\square$
c $6+7=$ double $6+1=\square$
d $3+4=$ double $3+1=\square$
e $8+9=$ double $8+1=\square$
f $7+8=$ double $7+1=\square$

6 Complete the near double strategy for these. This time you are calculating a near double that is $\mathbf{1}$ less.
a $8+7=$ double $8-1=\square$
b $6+5=$ double $6-1=$
c $5+4=$ double $5-1=$ $\square$ d $12+11=$ double $12-1=$
e $15+14=$ double $15-1=$ $\square$ f $16+15=$ double $16-1=$ $\square$

7 Complete these near double tables based on the double fact in the top row:


8 Who said what? Write the initials after each statement:
7
Sweet Seven (SS)

10
Terrific Ten (TT)

Famous Fifteen (FF)
b 'Double me and +2 you get 22.'
d 'Double me and -3 you get 27.' $\square$

## Addition mental strategies - bridge to ten

Bridge to ten is when we make the first number up to 10 and then add what is left.

Let's start by using ten frames:


8


4


10


2 $8+4=10+2=12$

1. Look carefully at the first set of ten frames. Bridge to ten on the second set and complete the addition.
a



$$
8+6=10+\square=\square
$$

b


$$
7+4=10+\square=\square
$$

c


$$
9+5=10+\square=\square
$$



$$
9+8=10+
$$

$\square$ $=$ $\square$

## Addition mental strategies - bridge to ten

We can also use number lines to bridge to the next ten and then add what is left.


2 Practise bridging to ten with each addition set. The first one has been done for you.

## Set 1 :

Set 2:
$a 8+6 \rightarrow 10+4=14$
a $16+5 \rightarrow \square+\square=\square$
$\mathrm{b} 7+5 \rightarrow \square+\square=\square$
b $17+6 \rightarrow \square+\square=\square$
c $6+7 \rightarrow \square+\square=\square$
c $19+6 \rightarrow \square+\square=\square$

3 Use the number lines to bridge to ten. Fill in the missing numbers each time. To help you get started, the first number line has 2 numbers filled in.
a $47+8=$

b $56+9=$ $\square$

c $73+15=\square$


## Addition mental strategies - bridge to ten

Continued from page 6.
3 Use the number lines to bridge to ten. Fill in the missing numbers each time.
$d 44+12=\square$

$e 84+11=\square$



4 Write a problem that matches this number line.

$$
\square+\square=\square \frac{\square}{\square \square}+\frac{\boxed{+6}}{\square}
$$

5 Complete these addition tables by bridging to the next ten in your head.
a

| Add 12 |  |
| :---: | :---: |
| 49 |  |
| 56 |  |
| 38 |  |

b

| Add 17 |  |
| :---: | :---: |
| 36 |  |
| 17 |  |
| 58 |  |

c

| Add 13 |  |
| :---: | :---: |
| 77 |  |
| 48 |  |
| 59 |  |

## Addition mental strategies - jump strategy

The jump strategy is when you use a number line to jump in tens and then units.


1 Practise jumping along the number line in tens:


2 Add these using the jump strategy. Show your working on each number line:
a $57+35=\square$
$\square$
b $54+28=\square$
 $\longleftrightarrow$
c $62+35=\square$


## 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.

$$
57+46 \begin{array}{r}
40 \\
\hline 6
\end{array} \rightarrow 57+40=97 \longrightarrow 97+6=103
$$

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

b

c

d


2 Practise adding tens to these numbers:

| + | 10 | 50 | 20 | 30 | 60 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 21 |  |  |  |  |  |
| 48 |  |  |  |  |  |

3 Use the split strategy with these problems:

b $29+28$
 $\rightarrow \square$ $\rightarrow \square$
c $75+14$
 $\rightarrow \square \rightarrow$
 $\longrightarrow$ $\square$


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## Addition mental strategies - split strategy version 2

Here is another way to use the split strategy.
$42+32=(4$ tens +3 tens $)+(2$ units +2 units $)$
$=7$ tens +4 units
$=74$

1 Use this way to add these:
$\begin{aligned} a 53+56 & =(\square \text { tens }+\square \text { tens })+(\square \text { units }+\square \text { units }) \\ & =\square \text { tens }+\square \text { units } \\ & =\square\end{aligned}$
b $35+24=(\square$ tens $+\square$ tens $)+(\square$ units $+\square$ units $)$

$$
\begin{aligned}
& =\square \text { tens }+\square \text { units } \\
& =\square
\end{aligned}
$$

c $78+11=(\square$ tens $+\square$ tens $)+(\square$ units $+\square$ units $)$
$=\square$ tens $+\square$ units
$=$ $\square$
d $45+24=(\square$ tens $+\square$ tens $)+(\square$ units $+\square$ units $)$
$=\square$ tens $+\square$ units
$\square$

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

| + | 65 | 85 | 36 | 23 | 41 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 12 |  |  |  |  |  |
| 34 |  |  |  |  |  |

## Mental addition strategies - word problems

1 Solve these word problems using either the jump or the split strategies. Show all your working.
a Mitch and Anna held a lemonade stall over the weekend. They sold 25 cups on Saturday and 18 cups on Sunday. How many cups did they sell altogether?
b I practised my guitar for 48 minutes before school and 34 minutes after school. How many minutes did I practise altogether?
c Charlotte received $\$ 15$ for her birthday from her grandmother. She added this to her savings account which has $\$ 53$. How much does Charlotte have now?

## Double or nothing

Getting ready

This is a game for two players. You will each need two copies of the set of cards below. So, a total of four pages per pair. Cut out your cards, then join them so that you have a deck of 36 cards.

copy

What to do

Shuffle the cards well and place face down in the centre. Player 1 turns over two cards and calls out the total. If the cards are a double (e.g. 4 and 4) or a near double and the total they have called out is correct, Player 1 keeps the cards. (For the cards to be a near double, there needs to be a difference of 1, e.g. $3+4,6+5$.) If the cards are not a double or near double they are put to one side. Player 2 repeats these steps. Continue taking turns until there are no cards left. The winner is the player with the most cards.


This is a game for two players. You will each need a copy of the set of cards below. Cut out your cards then join them so that you have a deck of 24 cards.

copy

What to do

Shuffle the cards well and place face down in the centre. Each player turns over two cards and calls out the total. The player with the largest total wins that round and takes all four cards. If players have the same answer, they tie, no one wins the round and these cards are put aside. Continue taking turns until there are no cards left. The winner is the player who wins the most rounds.


This is a game for two players. You will need four dice and a copy of this page to record your totals.


What to do

The aim of this game is to reach a total of 50. Each player takes a turn to roll a die four times and records the total in a row in one of the tables below. If your running score goes over 50, you strike out. You may choose to freeze after the first or second roll if you are getting close to 50 . Take turns until the table is full. The player who finishes the round closest to 50 , but not over 50 , scores 5 points. The player who finishes the round exactly on 50 , scores 10 points.

## Player 1

| ROUND 1 |  | ROUND 2 |  | ROUND 3 |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Rolled numbers | Running total | Rolled numbers | Running total | Rolled numbers | Running total |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Player 2

| ROUND 1 |  |
| :---: | :---: |
| Rolled <br> numbers | Running <br> total |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |


| ROUND 2 |  |
| :---: | :---: |
| Rolled <br> numbers | Running <br> total |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |


| ROUND 3 |  |
| :---: | :---: |
| Rolled <br> numbers | Running <br> total |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Subtraction mental strategies - related facts

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

1 Show the related addition and subtraction facts for each set of digits. The first one is partially completed for you.
a

| 8 | 4 |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| 8 | + | 4 | $=$ |  |
| 4 | + | 8 | $=$ |  |
| 12 | - | 4 | $=$ |  |
| 12 | - | 8 | $=$ |  |

b

| 7 |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
| 7 +  $=$ |  |  |  |  |
|  | + |  | $=$ |  |
|  | - |  | $=$ |  |
|  | - |  | $=$ |  |

c

| 13 |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- |
|  | + |  | $=$ |  |
|  | + |  | $=$ |  |
|  | - |  | $=$ |  |
|  | - |  | $=$ |  |

d

| 10 | + |  | $=$ |  |
| :--- | :--- | :--- | :--- | :--- |
|  | + |  | $=$ |  |
|  | - |  | $=$ |  |
|  | - |  | $=$ |  |

2 Ring a section of the dots in each box and write a related number sentence for each. The first one is partially done for you.
a


b

$\square+\square=18$
$c \quad \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc$ $\square$

## Subtraction mental strategies - patterns

Recognising patterns in subtraction is useful in extending known facts.
Can you see the pattern in this set of facts?
$17-3$ = 14
$37-3=34$
$27-3=24$
$47-3=44$

1. Extend each set of subtraction patterns in the sets below and then shade the answers on this grid:

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |

a Set 1

| 8 |  | = |
| :---: | :---: | :---: |
| 18 | - 2 | = |
| 28 | - 2 | = |
| 38 | - 2 | = |
| 48 | - 2 | = |
| 58 | - 2 | = |
| 68 | - 2 | = |
| 78 | - 2 | = |

b Set 2

| 25 | - 4 | $=$ |
| :---: | :---: | :---: |
| 35 | - 4 | $=$ |
| 45 | - 4 | $=$ |
| 55 | - 4 | $=$ |
| 65 | - 4 | = |
| 75 | - 4 | $=$ |
| 85 | - 4 | $=$ |
| 95 | - 4 | = |

c Set 3


2 Extend this subtraction pattern beyond the hundred grid:
a

d $118-7=\square$
b $98-\square=\square$
e 128 $\square$
$\square$
c $108-\square=\square$
f $138-7=\square$

## Subtraction mental strategies - bridge to ten

A ten frame is useful to show the bridge to ten strategy when subtracting.
Here are 17 counters in 2 tens frames.
When you see $17-8=?$, cross out 8 from the first ten frame then add what is left.

$17-8=9$

1. Use each ten frame to subtract using bridge to ten. Cross out the number of counters that are subtracted from the first ten frame:
a

b


d



2 Write a subtraction fact that matches each ten frame:
a


b

 $=$

C


## Subtraction mental strategies - bridge to ten

3 Complete the subtraction wheels. Use a ten frame in your mind.
a

b


4 Find the mystery number. Use the clues to write a matching subtraction fact. Add the answers for a to c , and then subtract from 50 . This is the mystery number.


Show your working here:

The mystery number is:

5 Complete these subtraction squares. Subtract the rows and columns as shown by the arrows:
a
$\left(-\begin{array}{|c|c|c|}\hline 15 & 5 & 10 \\ \hline 8 & 3 & \\ \hline & & 5 \\ \hline\end{array}\right.$
b -

|  | $\longrightarrow$ |  |
| :---: | :---: | :---: |
| 18 | 12 |  |
| 15 | 9 |  |
| 15 |  | 6 |

## Subtraction mental strategies - bridge to ten

Bridge to the next ten and then count on what is left.

$$
25-16=9
$$



6 Use the number lines to bridge to ten:
a $52-15=$ $\square$

b $62-13=\square$

c $75-12=\square$


## Subtraction mental strategies - bridge to ten

7 Complete the subtraction frame to match this number line:


8 Here is a jar of 165 shells. Three kids guessed how many shells were in the jar. Use bridge to ten on the number lines to show how close each guess was. The first one is done for you.
a Jo's guess: 152

$$
165-152=13
$$


b Liam's guess: 158

$$
\square-\square=\square
$$


c Joel's guess: 154

$$
\square-\square=\square
$$


d Whose guess was the closest?

## Subtraction mental strategies - counting on

If there is only a small difference between the numbers, use counting on to find the difference. See: 32-28=?

Think: What can you add to 28 to get 32 ? Count on by 4 .


1 Find the difference between these by counting on.
a $32-29=\square$
b $33-28=\square$
c $34-27=\square$
d $71-68=\square$
e $82-76=\square$
f $73-69=\square$
g $83-77=\square$
h $112-109=\square$
i $201-196=\square$

2 Use counting on to complete these function machines.
a

| In | Rule | Out |
| :---: | :---: | :---: |
| 41 |  |  |
| 4 |  |  |
| 44 | 37 |  |
| 42 |  |  |
|  |  |  |
| 45 |  |  |

b

| In | Rule | Out |
| :---: | :---: | :---: |
| 71 | -68 |  |
| 73 |  |  |
| 75 |  |  |
| 72 |  |  |

With function machines, numbers go in, have the rule applied and then come out.
c

| In | Rule | Out |
| :---: | :---: | :---: |
| 122 |  |  |
| 125 |  |  |
| 124 |  |  |
| 123 |  |  |
| 123 |  |  |

d

| In | Rule | Out |
| :---: | :---: | :---: |
| 101 | -98 |  |
| 105 |  |  |
| 107 |  |  |
| 103 |  |  |

e

| In | Rule | Out |
| :---: | :---: | :---: |
| 96 |  |  |
| 96 |  |  |
| 93 |  |  |
| 92 |  |  |
| 94 |  |  |
|  |  |  |

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## Subtraction mental strategies - counting on

Look for the pattern
in each table.
3) Complete each table of subtraction facts by counting on.
Table 1

| $21-19=$ |
| :--- |
| $33-29=$ |
| $48-39=$ |
| $64-59=$ |

b
Table 2

| $33-28=$ |
| :--- |
| $42-38=$ |
| $51-48=$ |
| $95-88=$ |

C
Table 3

| $20-17=$ |
| :--- | :--- |
| $101-97=:$ |
| $33-27=$ |
| $52-47=$ |

4. Complete each table of subtraction facts. Can you still use counting on?
a

| $-38=4$ |
| :---: | :---: |
| $-19=4$ |
| $-29=4$ |

b Table 2

| $-18=3$ |
| :---: | :---: |
| $-69=4$ |
| $-98=4$ |
| $-77=4$ |

c
Table 3

| $-79=6$ |
| :---: | :---: |
| $-48=6$ |
| $-39=6$ |
| $-19=6$ |

5 Roll a die and write this number in the triangle, then complete the subtraction:
a


b


d

e

k


Subtraction mental strategies - doubles and near doubles

As long as you know addition doubles, you will know subtraction doubles.

$$
5+5=10 \text { so } 10-5=5
$$

1 Answer the addition doubles and write a matching subtraction double.
a 6

$\square$ so

b

so

$-\square$ $=\square$
c

so

$d \longdiv { 8 } + \square$
so $\square$
$\square$

2 Play this game with a partner. Make copies of this page so you can play this game again. Player 1 chooses a subtraction double by tossing a counter onto the grid. Player 1 then ticks a circle in the column that has the answer. Player 2 repeats these steps. Take turns until someone has ticked a whole column on their own page.

| $24-12$ | $22-11$ | $20-10$ | $18-9$ |
| :---: | :---: | :---: | :---: |
| $16-8$ | $14-7$ | $12-6$ | $10-5$ |
| $8-4$ | $6-3$ | $4-2$ | $2-1$ |



## Subtraction mental strategies - doubles and near doubles

With near doubles subtraction, think of the doubles fact when you subtract, and then adjust.

$$
\text { See: } 15-7
$$

Think: $(14-7)+1$

See: 13-7
Think: (14-7)-1

3 Here's a doubles and near doubles addition chart. Remember, you need to know the addition doubles to use near doubles subtractions. Circle the doubles facts. The first two are circled for you $1+1=2,2+2=4$. Next, shade all the doubles facts +1 . Then all the double facts $\mathbf{- 1}$.

|  | $\mathbf{0}$ | $\mathbf{1}$ | $\mathbf{2}$ | $\mathbf{3}$ | $\mathbf{4}$ | 5 | 6 | 7 | 8 | 9 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 0 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 2 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 3 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 4 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 5 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 6 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 7 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| 8 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| 9 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |


| See | Think | Answer |
| :---: | :---: | :---: |
| $17-8$ | $(16-8)+1$ |  |
| $15-7$ |  |  |
| $13-6$ |  |  |
| $11-5$ |  |  |
| $9-4$ |  |  |


| See | Think | Answer |
| :---: | :---: | :---: |
| $3-2$ | $(4-2)-1$ | 1 |
| $5-3$ |  |  |
| $7-4$ |  |  |
| $9-5$ |  |  |
| $11-6$ |  |  |

4. With this table, you need to think of doubles outside the grid.

| See | Think | Answer |
| :---: | :---: | :---: |
| $31-15$ |  |  |
| $37-18$ |  |  |
| $51-25$ |  |  |
| $101-50$ |  |  |
| $61-30$ |  |  |

## Subtraction mental strategies - the jump strategy

The jump strategy is when you use a number line to jump in tens and then units. Look at $79-34$. First we jump back in tens and then units. So, $79-34=45$.


1 Subtract these using the jump strategy:
a $78-25=$ $\square$
b $93-31=$ $\square$
c $84-21=\square$
d $79-36=\square$
$\qquad$
e $95-42=\square$

## Subtraction mental strategies - the jump strategy

2 Use the jump strategy to calculate how much more each person needs to purchase a family pass.

a The Darnley family has saved $\$ 56$.

They need another: $\square$
b The Sommers family has saved $\$ 34$.

They need another: $\square$
c The Griffiths family has saved \$49.

They need another: $\square$

## Subtraction mental strategies - the split strategy

The split strategy is where we make the subtraction easy by splitting the second number into tens and ones. We then subtract each part separately.

$$
68-22 \begin{array}{|c}
20 \\
2
\end{array} \rightarrow 68-20=48 \rightarrow 48-2=46
$$

1) Practise subtracting tens from these numbers:

| - | 10 | 30 | 20 | 30 | 50 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 96 |  |  |  |  |  |
| 71 |  |  |  |  |  |

2 Use the split strategy with these problems:


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## Subtraction mental strategies - the split strategy

(3) Use the split strategy to solve this cross number puzzle:

| 1 |  |  | 2 |  | 3 | 4 |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |



Getting ready

This is a game for two players. You will need a die and a copy of this page to record your answers. You may like to make a few copies so you can play again.

copy

The aim of this game is to get the lowest finishing score. Player 1 rolls the die and writes this number in the first column. Next, they decide whether to add 10 or multiply by 5 and subtract this number from 100. The result will be their running score and Player 1 will subtract from their running score on their next turn. Player 2 repeats these steps. Continue taking turns until the table is filled. The lowest finishing score wins.

I have to be careful when choosing whether to +10 or $\times 5$ because I don't want to get below zero but I want to get close to zero!


THINK

## Player 1

| Number <br> on die | Number <br> used | Running <br> score |
| :---: | :---: | :---: |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Player 2

| Number <br> on die | Number <br> used | Running <br> score |  |  |
| :--- | :--- | :--- | :---: | :---: |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
| Finishing score |  |  |  |  |

## Subtract from 100

This is a game for two players. You will need two dice and 10 counters each, in two different colours.

What to do

The aim of the game is to use all your counters first. Player 1 rolls the two dice and makes a 2 digit number from the numbers rolled. They subtract this 2 digit number from 100, find the answer on the grid and cover the number with a counter.

Player 2 repeats this process. The winner is the first player to get rid of all their counters.

| 85 | 38 | 39 | 79 | 86 | 59 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 68 | 55 | 57 | 69 | 37 | 54 |
| 34 | 87 | 36 | 44 | 56 | 47 |
| 58 | 49 | 64 | 66 | 77 | 46 |
| 45 | 78 | 67 | 75 | 76 | 89 |
| 74 | 88 | 84 | 65 | 48 | 35 |

Addition and Subtraction

## Written methods - addition to 99, no regrouping

Using a written method to add is very similar to this version of the split strategy:

$$
\begin{aligned}
42+31 & =(4 \text { tens }+3 \text { tens })+(2 \text { units }+1 \text { unit }) \\
& =7 \text { tens }+3 \text { units } \\
& =73
\end{aligned}
$$

The difference is that we set the numbers up in place value columns and add the units first.

|  | $\vdots$ |  |
| :---: | :---: | :---: |
|  | tens | units |
|  | 4 | 2 |
| + | 3 | 1 |
|  | 7 | 3 |

1 For each addition, complete it with the split strategy and then use the written method.


|  |  |  |
| :---: | :---: | :---: |
|  | tens | units |
|  | 5 | 5 |
| + | 2 | 5 |
|  | 2 | 3 |
|  |  |  |

b $42+35=\left(\square_{\text {tens }}+\square_{\text {tens }}^{\square}\right)+\left(\square_{\text {units }}+\square_{\text {units }}\right)$
$=\square_{\text {tens }}^{\square}+\prod_{\text {units }}$
$=\square$
$c 61+18=(\square_{\text {tens }}+\underbrace{\square}_{\text {tens }})+(\underbrace{\square_{\text {units }}}_{\text {units }})$
$=\square_{\text {tens }}^{\square}+\square_{\text {units }}$
$=$

$d 65+32=(\square_{\text {tens }}+\underbrace{\square}_{\text {tens }})+(\underbrace{}_{\text {units }}+\underbrace{\square_{\square}}_{\text {units }})$
$=\square_{\text {tens }}^{\square}+\square_{\text {units }}$
$=\square$


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## Written methods - addition to 99 , no regrouping

2 Add these using the written method. Add the units, then the tens. Write your answer neatly in line with the place value columns.
a

|  | tens | units |
| :---: | :---: | :---: |
|  | 4 | 3 |
|  | 4 | 3 |
| + | 3 | 2 |
|  |  |  |
|  |  |  |

b

C

|  | tens | units |
| :---: | :---: | :---: |
|  | 3 | 6 |
| + | 5 | 2 |
|  |  | 2 |
|  |  |  |
|  |  |  |

d

e

f


3 Now try adding three 2 digit numbers using the written method:
a

|  | tens | units |
| :---: | :---: | :---: |
|  | 3 | 0 |
|  | 2 | 1 |
|  | 2 | 1 |
| + | 2 | 6 |
|  |  |  |
|  |  |  |

b

|  | tens | units |
| :---: | :---: | :---: |
|  | 3 | 4 |
|  | 4 | 1 |
|  | 4 | 1 |
| + | 2 | 3 |
|  |  |  |
|  |  |  |

c

|  | tens | units |
| :---: | :---: | :---: |
|  | 2 | 3 |
|  | 3 | 5 |
|  | 3 | 5 |
| + | 3 | 0 |
|  |  |  |
|  |  |  |

4 Write the missing digits in these problems:
a

|  | tens | Units |
| :---: | :---: | :---: |
|  | 2 | $\square$ |
|  |  | 2 |
|  |  | 2 |
| + | 4 | 1 |
|  | 9 | 6 |

b

c


## Written methods - addition to 99 with regrouping

Here is a place value board that shows how regrouping works. If we have 10 units, we should regroup into a ten.


On the first place value board we can see that there are 3 tens and 11 units. We regroup 10 units into 1 ten and we get 4 tens and 1 unit.


1 For each set of place value boards, regroup the units into a ten and show the regrouped amount on the next board. b Just use straight lines for tens (longs) and squares for units (shorts).


| tens | units |
| :--- | :--- |
|  |  |
|  |  |

2 Add the numbers shown in longs and shorts. Use the first place value board to show the longs and shorts combined and regroup them on the second board. Record the addition problem in the squares:
a



b


| tens | units |
| :---: | :---: |
|  |  |
|  |  |
|  |  |
|  |  |


| tens | units |
| :--- | :--- |
|  |  |
|  |  |

## Written methods - addition to 99 with regrouping

Now that you have practised regrouping on place value boards, we are going to apply this to a written strategy of addition where you have to regroup.

Let's look at $53+19$. If we use longs and shorts in columns, it looks like this.

Then, we regroup the tens and units to get the answer 72.

Now look at the written method for addition when regrouping:


| e: | 70 |  |
| :---: | :---: | :---: |
|  | tens | units |
|  | 1 | 5 |
|  | 3 | 3 |
| + | 1 | 9 |
|  | 7 | 2 |

First, estimate the answer:
$50+20=70$. You estimate by rounding to the nearest 10.
Add the units: $3+9=12$
Think of this as 1 ten and 2 units.
Write the 2 in the units column and put the 1 in the tens column.
Now add the tens and write 7 in the tens column. Is our answer reasonable? Yes, because it is close to our estimate.

3 Try adding these $\mathbf{2}$ digit numbers using the written method. Start by writing your estimate:


## Written methods - addition to 99 with regrouping

Continued from page 34.
3 Try adding these 2 digit numbers using the written method. Start by writing your estimate:
d


g

h



4 Solve these word problems using the written method:
a I drove 39 km on Thursday and 58 km on Friday. How far did I drive altogether?

b Our class sold 19 raffle tickets during the first week of sales and 59 raffle tickets during the second week. How many were sold altogether?


## Written methods - subtraction to 99, no regrouping

Here is the written method for subtraction. The longs and shorts show you the place value. But you actually use digits.


1 Subtract these using the written method. Subtract the units then the tens. Write your answer neatly in line with the place value columns:

d

|  | tens | units |
| :---: | :---: | :---: |
|  | 5 | 8 |
| - | 4 | 2 |
|  |  |  |
|  |  |  |
|  |  |  |

e

|  | tens | units |
| :---: | :---: | :---: |
|  | 7 | 8 |
| - | 3 | 2 |
|  |  |  |
|  |  |  |

f |  | tens | units |
| :---: | :---: | :---: |
|  | 6 | 8 |
|  | 2 | 8 |
|  | 3 | 5 |
|  |  |  |
|  |  |  |

g

|  | tens | units |
| :---: | :---: | :---: |
|  | 6 | 7 |
| - | 1 | 2 |
|  |  |  |
|  |  |  |
|  |  |  |

h

|  | tens | units |
| :---: | :---: | :---: |
|  | 3 | 4 |
| - | 1 | 3 |
|  |  |  |
|  |  |  |

i

|  | tens | units |
| :--- | :---: | :---: |
|  | 9 | 7 |
| - | 2 | 6 |
|  |  |  |
|  |  |  |

Written methods - subtraction to 99 with regrouping

These place value boards show how we can regroup a ten into units.


4 tens and 1 unit is now 3 tens and 11 units.

1 For each set of place value boards, regroup a ten into units and show the new amount on the next board. Just use straight lines for tens and squares for units.
a


| tens | units |
| :---: | :---: |
|  |  |
|  |  |
|  |  |

b


2 Complete this subtraction problem shown in longs and shorts. Regroup a ten into units and then subtract. Show your answer in longs and shorts:


| tens | units |
| :--- | :--- |
|  |  |
|  |  |
|  |  |


| tens | units |
| :---: | :---: |
|  |  |
| $H B$ | $B$ |
| $B$ | $B$ |


$=$| tens | units |
| :--- | :--- |
|  |  |
|  |  |

## Written methods - subtraction to 99 with regrouping

Now that you can regroup a ten on the place value board, we can look at written subtraction with regrouping.

Here is $62-18$ shown in longs and shorts. If we regroup a ten into units, we can now subtract the units.

Now look at the written method for subtraction when regrouping.

e: 40

|  | tens | units |
| :---: | :---: | :---: |
|  | 5 | 1 |
|  | 2 |  |
| - | 1 | 8 |
|  | 4 | 4 |

First, estimate the answer: $60-20=40$. You estimate by rounding to the nearest 10. Look at the units. We can't subtract 8 from 2, so we regroup a ten into units.

We now have 12 units. 12 subtract 8 is 4 , so we write 4 in the units column. Now subtract the tens. 5 tens subtract 1 ten is 4 tens. Write 4 in the tens column.

Is our answer reasonable? Yes, because it is close to our estimate.

3 Complete these written subtraction problems with regrouping. Start by writing your estimate:
a

| e: |  |  |
| :--- | :---: | :---: |
|  | tens | units |
|  | 7 | 2 |
|  | 7 | 2 |
| - | 2 | 8 |
|  |  |  |
|  |  |  |

b



Continued on page 39.

Written methods - subtraction to 99 with regrouping Continued from page 38.

3 Complete these written subtraction problems with regrouping. Start by writing your estimate:
d


f

| e: |  |  |
| :--- | :---: | :---: |
|  | tens | units |
|  | 9 | 6 |
|  | 2 | 8 |
| - | 2 | 8 |
|  |  |  |
|  |  |  |

g

h

i

| e: |  |  |
| :--- | :---: | :---: |
|  | $\vdots$ |  |
|  | tens | units |
|  | 9 | 7 |
|  | 6 | 7 |
| - | 6 | 8 |
|  |  |  |
|  |  |  |

4 What is the digit behind the star?
a

|  | tens | units |
| :---: | :---: | :---: |
|  | 7 | 2 |
| - | 5 | 2 |
|  | 1 | 6 |

b

c

|  | tens | units |
| :---: | :---: | :---: |
|  | 7 | 9 |
| - | 5 |  |
|  | 2 |  |

$\hbar=\square$
$W=\square$
$W=\square$

## Rolling subtraction

Getting ready

What to do

This is a game for two players. You will need two dice and each player needs a copy of this page to record their answers. You may like to make a few copies so you can play again.

copy

The aim of the game is to get as close as possible to zero. Roll the dice and write this number in the first row under 99. Subtract and record the answer in the next row. Roll the dice again to create another 2 digit number and subtract again. If you can't make a 2-digit number to subtract, you miss a turn. Players take turns and may subtract only one number on the dice once they get closer to zero. The winner of a round is the player who gets the closest to zero. Play the best out of three.

| Example |  |  |
| :---: | :---: | :---: |
|  | Number on die 1 | $\begin{aligned} & \text { Number } \\ & \text { on die } \end{aligned}$ |
|  | 9 | 9 |
| - | 3 | 4 |
|  | 6 | 5 |
| - | 4 | 1 |
|  | 2 | 4 |
| - | 1 | 3 |
|  | 1 | 1 |
| - |  | 5 |
|  |  | 6 |
| - |  | 6 |
|  |  | 0 |
| - |  |  |
| - |  |  |
|  |  |  |


| Round 1 |  |  |
| :--- | :--- | :--- |
|  | 9 | 9 |
|  |  |  |
|  |  |  |
| - |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |


| Round 2 |  |  |
| :--- | :--- | :--- |
|  | 9 | 9 |
|  |  |  |
|  |  |  |
| - |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |


| Round 3 |  |  |
| :--- | :--- | :--- |
|  | 9 | 9 |
|  |  |  |
| - |  |  |
| - |  |  |
| - |  |  |
| - |  |  |
| - |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## Money - coin combinations

It is important to be able to recognise coins and add different combinations quickly.

1 Label each of these coins:


2 Add each amount of coins:

(3) Show \$10 using a combination of all the coins in question 1.


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## Money - coin combinations

4. Cross out all the coins you trade for each amount shown at the top of each group of coins. How much is left over each time?
a Trade for $\$ 1$


Amount left over
$\square$
b Trade for \$2


Amount left over
$\qquad$
c Trade for $\$ 5$


Amount left over
$\square$
d Trade for $\$ 10$


Amount left over
$\square$

## Money - coin combinations

5 Show how you pay for these party supplies using exact amounts. Place the same number of ticks in the column of the coin you would use. The first one has been done for you.

|  |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- |

6 You have this amount to spend:


List the party supplies that you can buy. Spend as close to the full amount as you can.

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## Money - note combinations

These are the notes in our currency.

( How much money is there?


2 Link the price tags that add to $\$ 100$ by connecting them with a line.


Money - finding change

When you buy something and you don't have the exact combination of notes and coins, you can pay with a larger amount and get the difference back. This is called change.
For example, if I buy some fruit that costs $\$ 2.85$ with a $\$ 5.00$ note, I would get back $\$ 2.15$ in change. Bridge to the next dollar and then add the rest.


1) Practise bridging to the next dollar:
a

c

b

d


2 Bridge to the next dollar on these number lines to find the change:
a

b

c


Change is: $\square$

## Money - adding dollar amounts

1 Over the weekend Jo and Barney held a lemonade stall at the corner of the street where they live. This table shows how much profit they made each day.

|  | Saturday | Sunday |
| :---: | :---: | :---: |
| Large | $\$ 15.25$ | $\$ 24.75$ |
| Small | $\$ 12.80$ | $\$ 36.20$ |

Find each of these totals. The split strategy would be useful.
a What was the profit on large lemonades?
b What was the profit on Saturday?
c What was the total profit on large and small lemonades over the whole weekend?

This is a game for two players. You will need a copy of this page and page 48; and three same colour counters each.

copy

Use the game board below. Then cut out the coin cards on page 48 and shuffle well. Take turns turning over four cards at a time. Add the coins and look for the total on the grid. If the total is on the grid, then place a counter on it.

The first player to place a counter on three amounts next to each other in any direction, wins.

| $\$ 5.50$ | $\$ 3.70$ | $\$ 6.10$ | $\$ 1.80$ |
| :--- | :--- | :--- | :--- |
| $\$ 2.20$ | $\$ 3.20$ | $\$ 1.70$ | $\$ 1.80$ |
| $\$ 6.20$ | $\$ 4.20$ | $\$ 5.50$ | $\$ 4.10$ |
| $\$ 1.80$ | $\$ 3.70$ | $\$ 1.50$ | $\$ 1.70$ |

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## Claim the totals


$\qquad$


Addition and Subtraction

