Mathletics

Series D Student

Addition and Subtraction

My name

First edition printed 2009 in Australia.

A catalogue record for this book is available from 3P Learning Ltd.

ISBN 978-1-921860-39-3

Published 3P Learning Ltd

For more copies of this book, contact us at: www.3plearning.com/contact

Designed 3P Learning Ltd

Series D – Addition and Subtraction

Contents

Series D – Addition and Subtraction

Contents

Series Author:

Nicola Herringer

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			

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 (6) 3 (4) = ☐

b 1 5 5 = ☐

c 9 5 1 = ☐

d 7 6 3 = ☐

e 5 6 4 = ☐

f 2 1 8 = ☐

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

6	3	1	6	9	2	8	5
4	1	3	3	3	8	3	5
3	7	1	4	6	2	5	3
3	3	9	6	3	1	2	7

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

_____ = ☐

Addition mental strategies – look for patterns

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

1 **Add 10 each time:**

a	10			
b	15			
c	7			

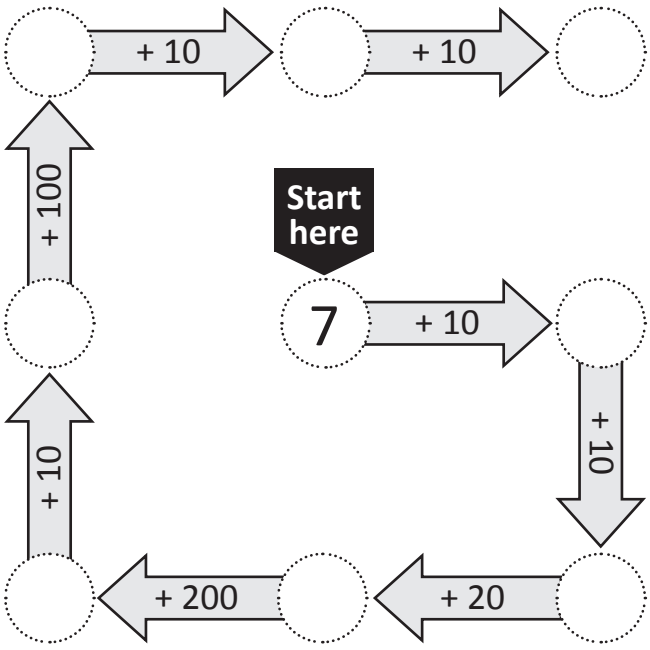
2 **Add 100 each time:**

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:**

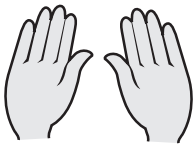


Addition mental strategies – doubles and near doubles

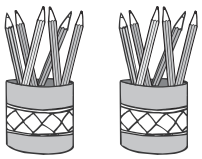
Doubles facts are the same number added together.

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

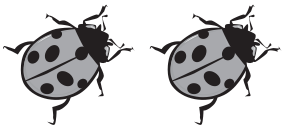
1 **Write a doubles fact to match each picture:**

a Double the fingers: 

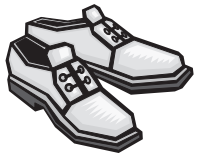
If I double ☐ I will get ☐

b Double the pencils: 

If I double ☐ I will get ☐

c Double the spots: 

If I double ☐ I will get ☐

d Double the lace holes: 

If I double ☐ I will get ☐

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

(5) (7) (9) (2) (12) (8)

☐ + ☐ = ☐ ☐ + ☐ = ☐ ☐ + ☐ = ☐

☐ + ☐ = ☐ ☐ + ☐ = ☐ ☐ + ☐ = ☐

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 → ☐ **b** 12 → ☐ **c** 16 → ☐ **d** 14 → ☐

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 = ☐

c 6 + 7 = double 6 + 1 = ☐

d 3 + 4 = double 3 + 1 = ☐

e 8 + 9 = double 8 + 1 = ☐

f 7 + 8 = double 7 + 1 = ☐

6 **Complete the near double strategy for these. This time you are calculating a near double that is 1 less.**

a 8 + 7 = double 8 – 1 = ☐

b 6 + 5 = double 6 – 1 = ☐

c 5 + 4 = double 5 – 1 = ☐

d 12 + 11 = double 12 – 1 = ☐

e 15 + 14 = double 15 – 1 = ☐

f 16 + 15 = double 16 – 1 = ☐

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

a

12 + 12 = 24
12 + 13 =
12 + 11 =
12 + 14 =

b

15 + 15 = 30
15 + 14 =
15 + 16 =
15 + 18 =

c

16 + 16 = 32
16 + 19 =
16 + 12 =
16 + 17 =

8 **Who said what? Write the initials after each statement:**

7 Sweet Seven (SS) — 10 Terrific Ten (TT) — 15 Famous Fifteen (FF) — 9 Nifty Nine (NN)

a 'Double me and – 4 you get 10.' ☐

b 'Double me and + 2 you get 22.' ☐

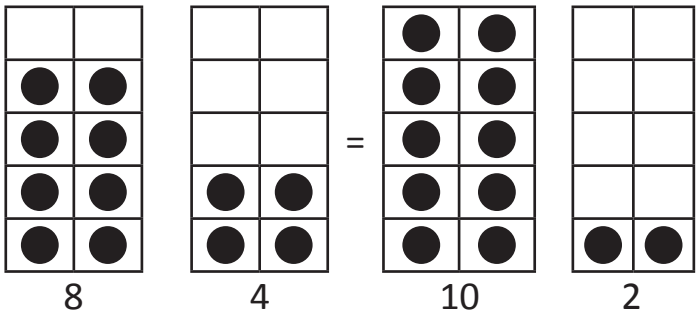
c 'Double me and – 1 you get 17.' ☐

d 'Double me and – 3 you get 27.' ☐

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.

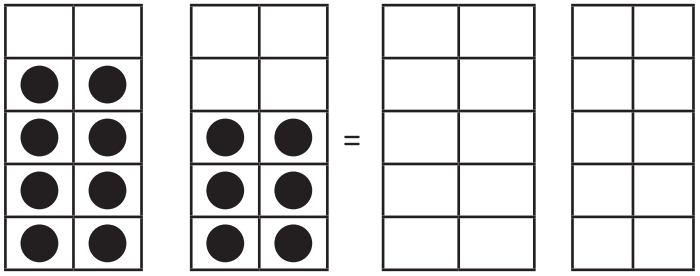
Let's start by using ten frames:



8 + 4 = 10 + 2 = 12

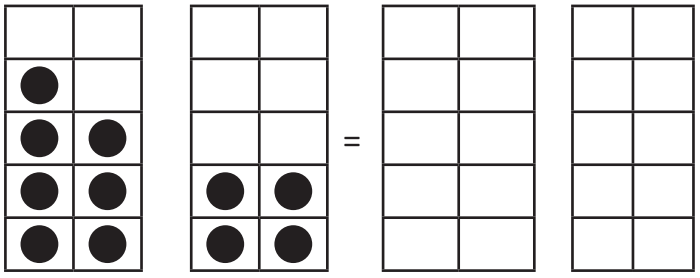
1 **Look carefully at the first set of ten frames. Bridge to ten on the second set and complete the addition.**

a



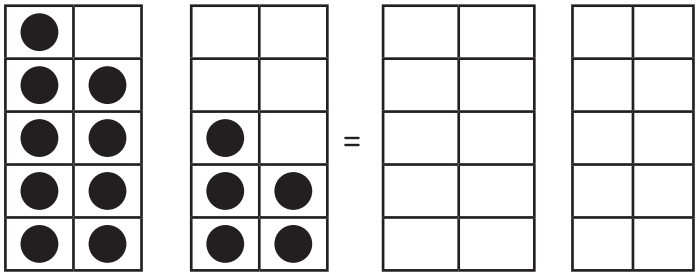
8 + 6 = 10 + ☐ = ☐

b



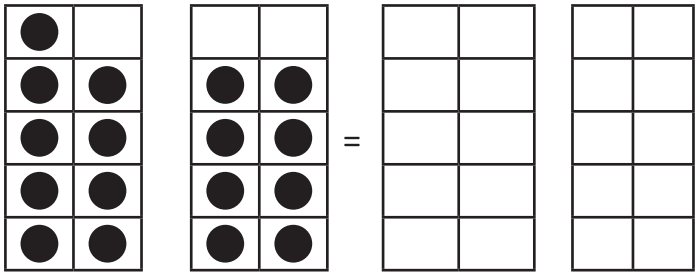
7 + 4 = 10 + ☐ = ☐

c



9 + 5 = 10 + ☐ = ☐

d

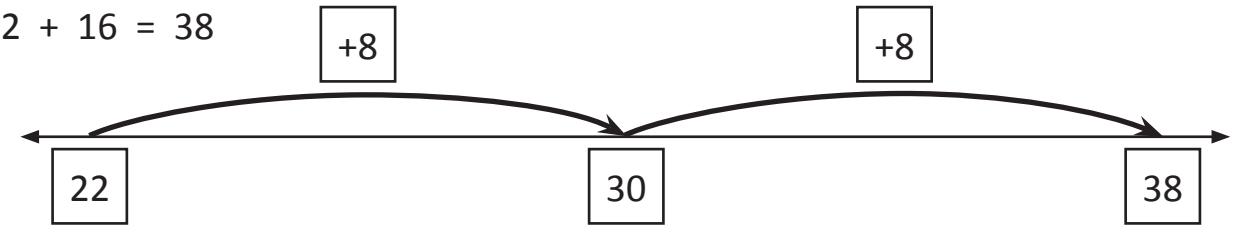


9 + 8 = 10 + ☐ = ☐

Addition mental strategies – bridge to ten

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

22 + 16 = 38



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

Set 1:

a 8 + 6 → 10 + 4 = 14

b 7 + 5 → ☐ + ☐ = ☐

c 6 + 7 → ☐ + ☐ = ☐

Set 2:

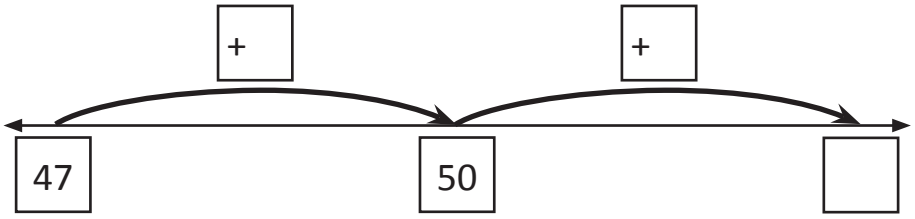
a 16 + 5 → ☐ + ☐ = ☐

b 17 + 6 → ☐ + ☐ = ☐

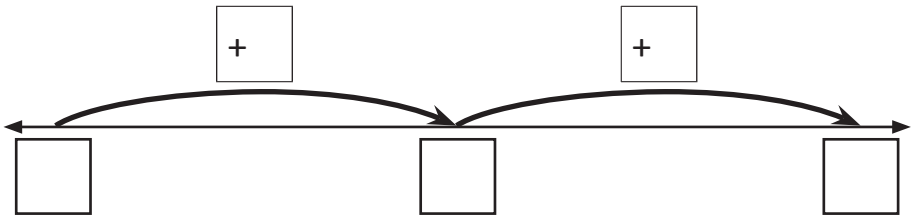
c 19 + 6 → ☐ + ☐ = ☐

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.**

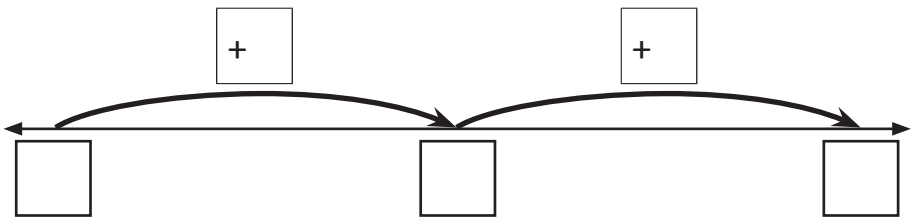
a 47 + 8 = ☐



b 56 + 9 = ☐



c 73 + 15 = ☐



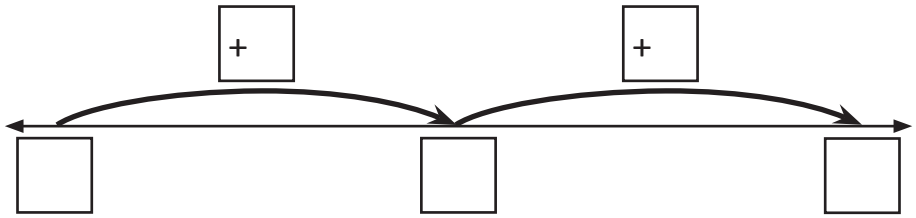
Continued on page 7.

Addition mental strategies – bridge to ten

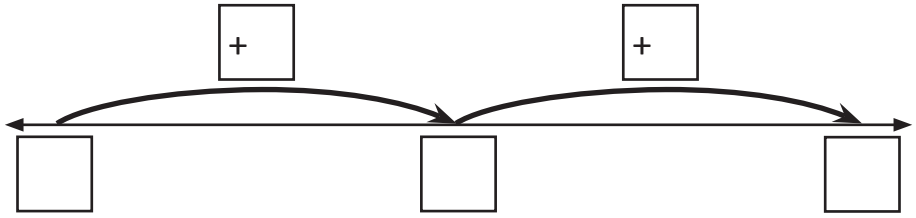
Continued from page 6.

3 **Use the number lines to bridge to ten. Fill in the missing numbers each time.**

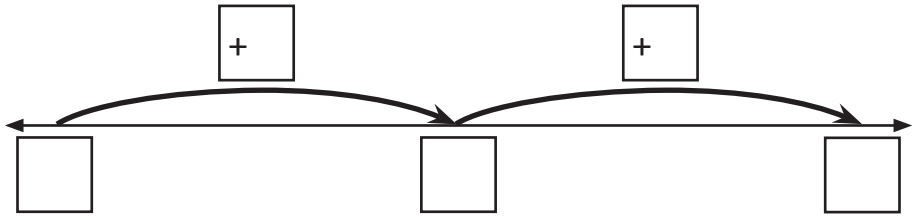
d 44 + 12 = ☐



e 84 + 11 = ☐

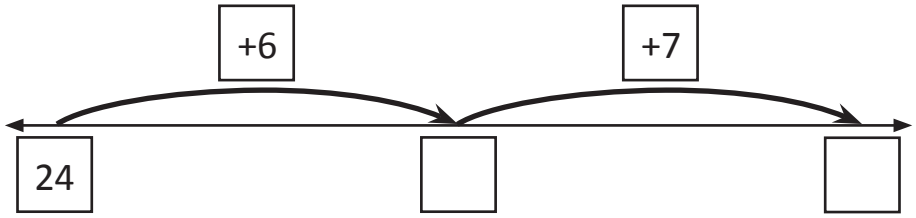


f 132 + 15 = ☐



4 **Write a problem that matches this number line.**

☐ + ☐ = ☐



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

a

Add 12	
49	
56	
138	

b

Add 17	
36	
17	
158	

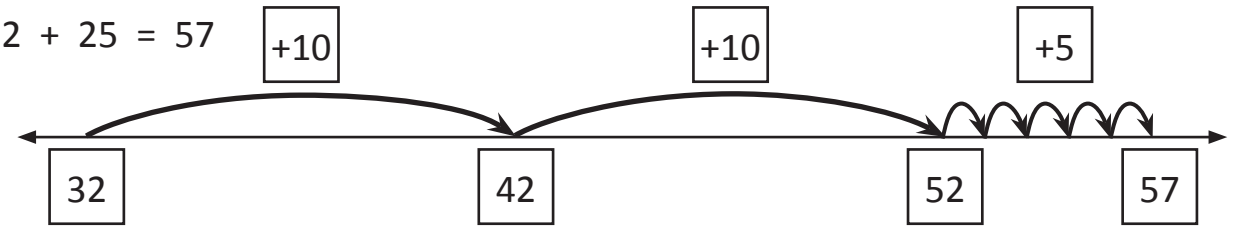
c

Add 13	
77	
48	
159	

Addition mental strategies – jump strategy

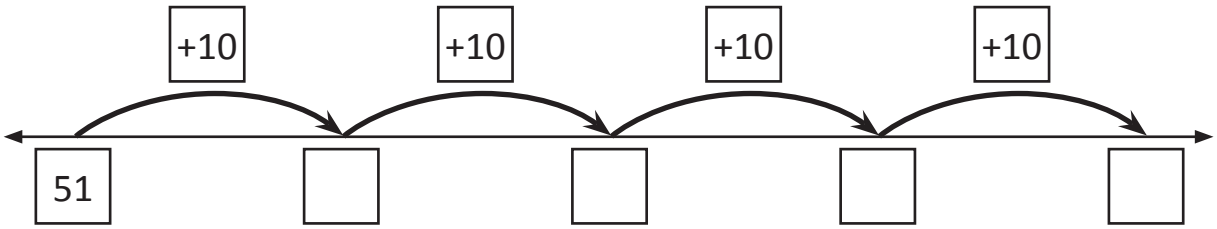
The jump strategy is when you use a number line to jump in tens and then ones.

32 + 25 = 57

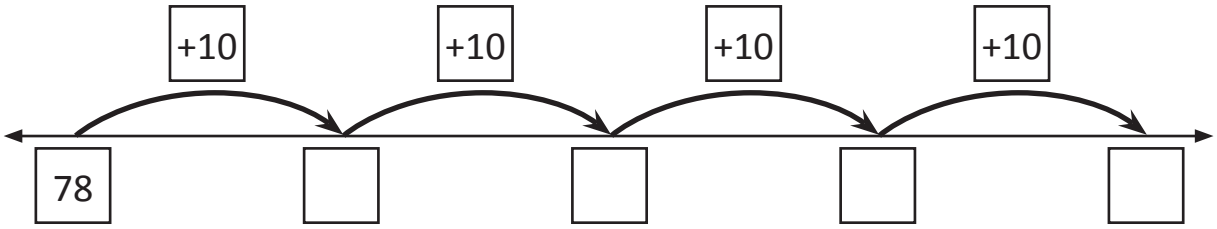


1 **Practise jumping along the number line in tens:**

a



b



2 **Add these using the jump strategy. Show your working on each number line:**

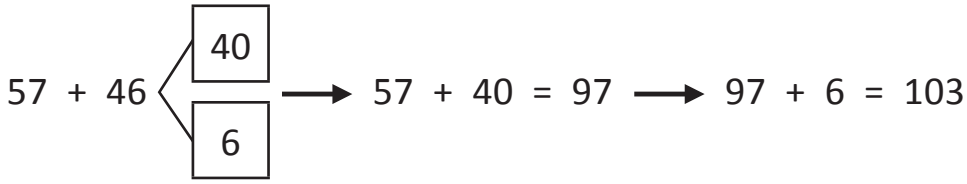
a 57 + 35 = ☐

b 54 + 28 = ☐

c 162 + 35 = ☐

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.



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

a 22 → *20*, *2*

b 57 → ☐, ☐

c 65 → ☐, ☐

d 96 → ☐, ☐

2 **Practise adding tens to these numbers:**

+	10	50	20	30	60
21					
48					

3 **Use the split strategy with these problems:**

a 38 + 34 → ☐, ☐ → ☐ → ☐

b 29 + 28 → ☐, ☐ → ☐ → ☐

c 75 + 14 → ☐, ☐ → ☐ → ☐

d 94 + 17 → ☐, ☐ → ☐ → ☐

Addition mental strategies – split strategy version 2

Here is another way to use the split strategy.

42 + 32 = (4 tens + 3 tens) + (2 ones + 2 ones)

= 7 tens + 4 ones

= 74

1 **Use this way to add these:**

a 53 + 56 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

b 35 + 24 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

c 78 + 11 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

d 45 + 24 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

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

+	65	85	36	23	41
12					
34					

Addition mental 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

apply

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.

1	2	3
4	5	6
7	8	9

Two card sum

apply

Getting ready

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.

15	12	13
14	5	16
17	18	2
10	6	8

First to 50

apply

Getting ready

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

copy

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	
Rolled numbers	Running total

ROUND 2	
Rolled numbers	Running total

ROUND 3	
Rolled numbers	Running total

Player 2

ROUND 1	
Rolled numbers	Running total

ROUND 2	
Rolled numbers	Running total

ROUND 3	
Rolled numbers	Running 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		12
8	+	4	=	
4	+	8	=	
12	–	4	=	
12	–	8	=	

b

7		9		16
	+		=	
	+		=	
	–		=	
	–		=	

c

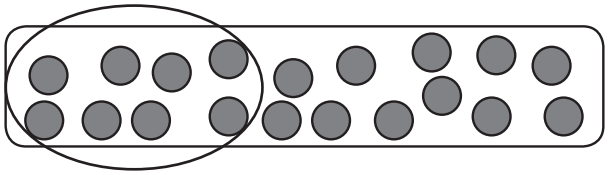
13		7		20
	+		=	
	+		=	
	–		=	
	–		=	

d

10		8		18
	+		=	
	+		=	
	–		=	
	–		=	

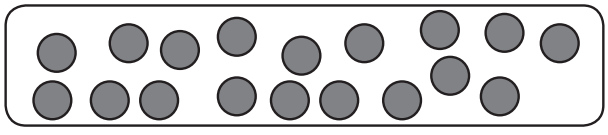
2 **Ring a section of the dots in each box and write a related number sentence for each. The first one is partially done for you.**

a



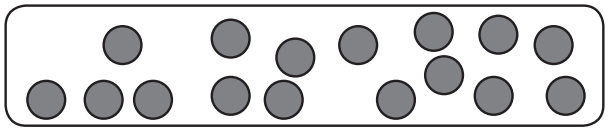
8 + ☐ = 19

b



☐ + ☐ = 18

c



☐ + ☐ = 16

Subtraction mental strategies – identify 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 – 2 = ☐
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

19 – 6 = ☐
29 – 6 = ☐
39 – 6 = ☐
49 – 6 = ☐
59 – 6 = ☐
69 – 6 = ☐
79 – 6 = ☐
89 – 6 = ☐

2 **Extend this subtraction pattern beyond the hundred grid:**

a 88 – 7 = ☐ **b** 98 – 7 = ☐ **c** 108 – 7 = ☐

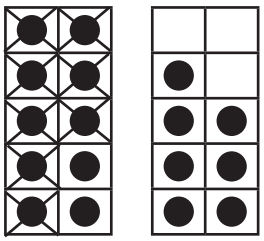
d 118 – 7 = ☐ **e** 128 – 7 = ☐ **f** 138 – 7 = ☐

Subtraction mental strategies – bridge to ten

A ten frame is useful to show the bridge to ten strategy when subtracting.

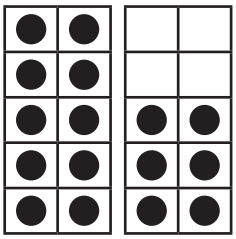
Here are 17 counters in 2 tens frames.

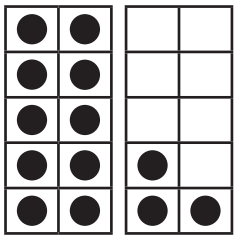
When you see 17 – 8 = ?, cross out 8 from the first ten frame then add what is left.

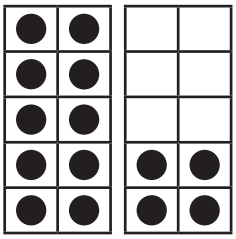


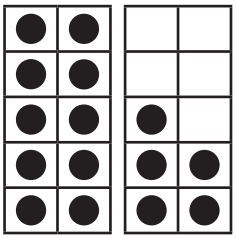
17 – 8 = 9

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:**

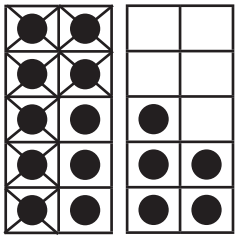
a  16 – 9 = ☐

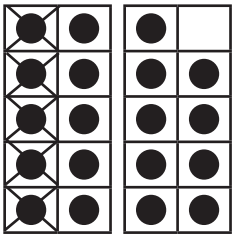
b  13 – 7 = ☐

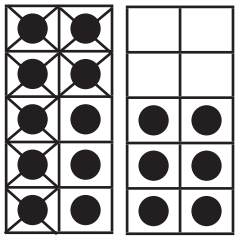
c  14 – 9 = ☐

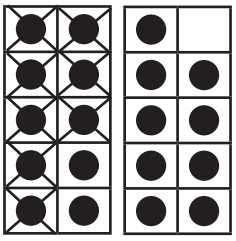
d  15 – 8 = ☐

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

a  ☐ – ☐ = ☐

b  ☐ – ☐ = ☐

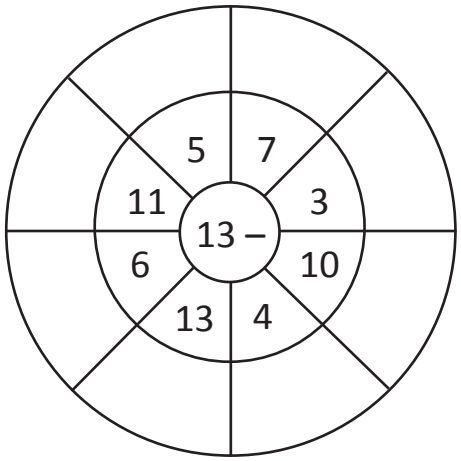
c  ☐ – ☐ = ☐

d  ☐ – ☐ = ☐

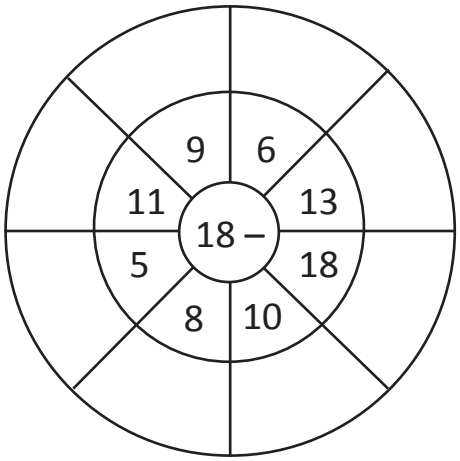
Subtraction mental strategies – bridge to ten

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

a

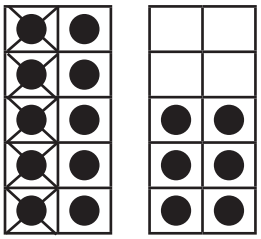


b

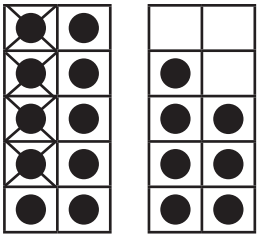


4 **Find the mystery number. Use the clues to write a matching subtraction fact. Add the answers for a to c, and then subtract from 50. This is the mystery number.**

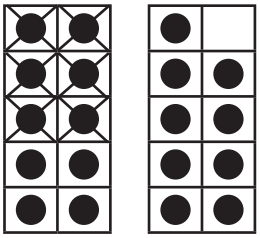
a ☐ – ☐ = ☐



b ☐ – ☐ = ☐



c ☐ – ☐ = ☐



Show your working here:

The mystery number is:

5 **Complete these subtraction squares. Subtract the rows and columns as shown by the arrows:**

a

–			
	15	5	10
	8	3	
			5

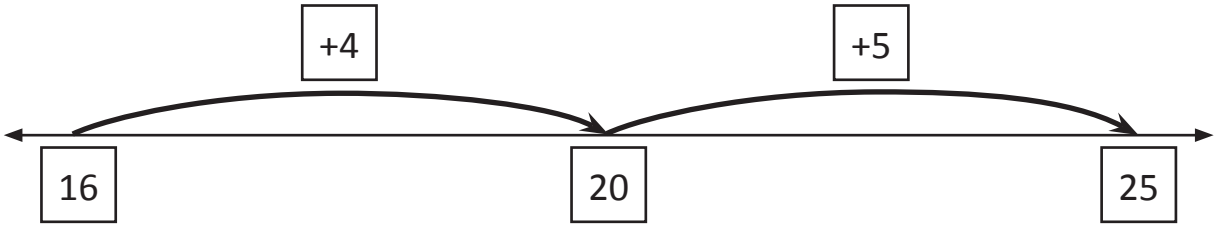
b

–			
		18	12
	15	9	
	15		6

Subtraction mental strategies – bridge to ten

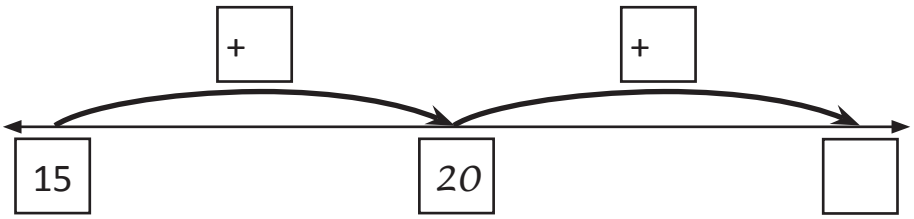
Bridge to the next ten and then count on what is left.

25 – 16 = 9

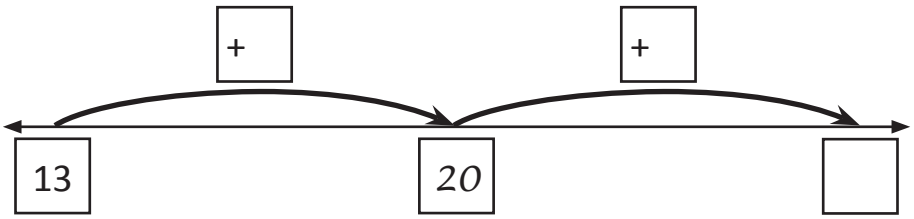


6 **Use the number lines to bridge to ten:**

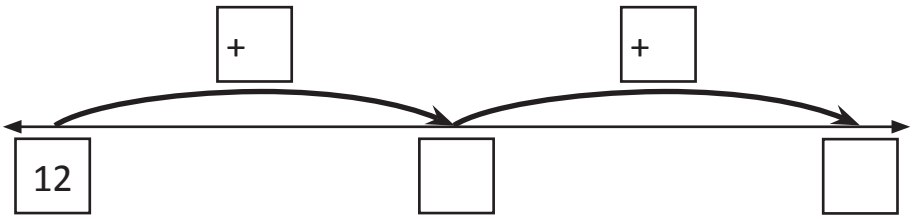
a 52 – 15 = ☐



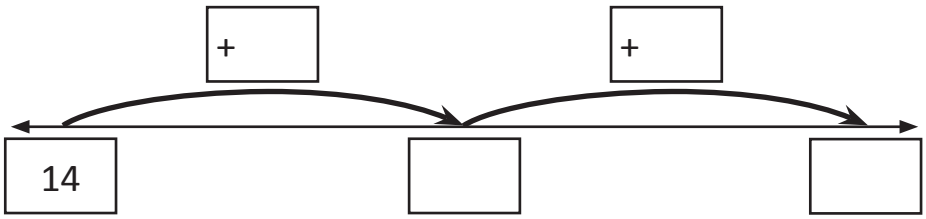
b 62 – 13 = ☐



c 75 – 12 = ☐



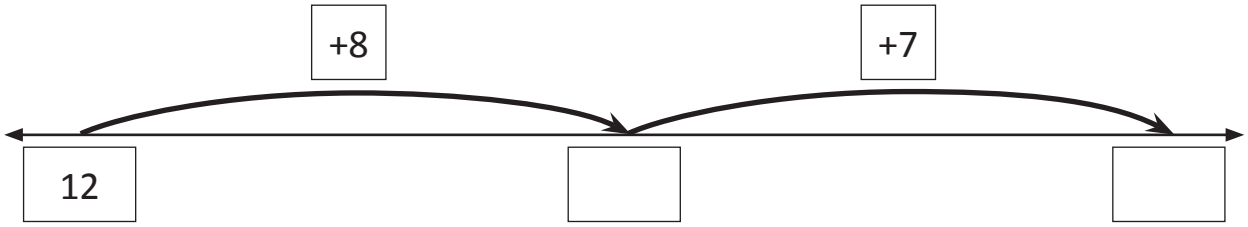
d 192 – 14 = ☐



Subtraction mental strategies – bridge to ten

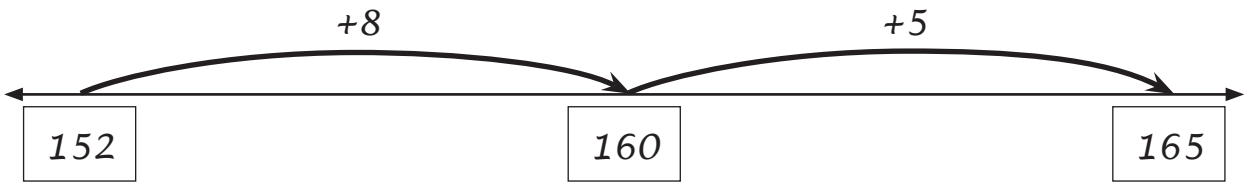
7 **Complete the subtraction frame to match this number line:**

[ ] – [ ] = [ ]

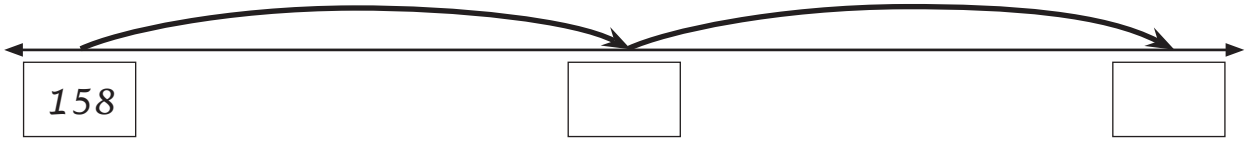


8 **Here is a jar of 165 shells. Three kids guessed how many shells were in the jar. Use bridge to ten on the number lines to show how close each guess was. The first one is done for you.**

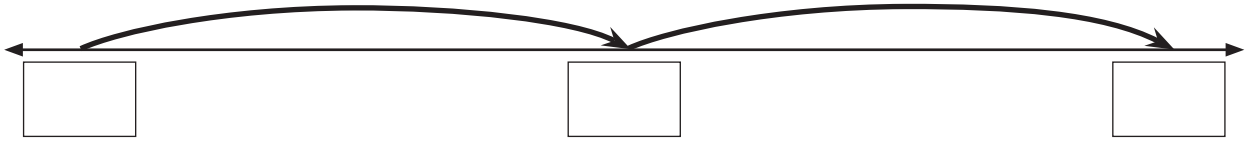
a Jo's guess: 152 [165] – [152] = [13]



b Liam's guess: 158 [ ] – [ ] = [ ]



c Joel's guess: 154 [ ] – [ ] = [ ]

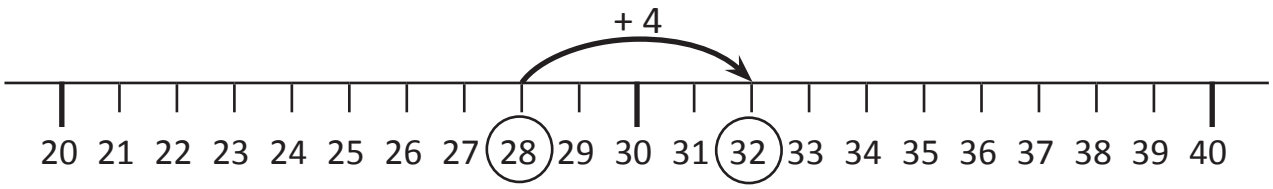


d Whose guess was the closest? _____

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 = ☐ **b** 33 – 28 = ☐ **c** 34 – 27 = ☐

d 71 – 68 = ☐ **e** 82 – 76 = ☐ **f** 73 – 69 = ☐

g 83 – 77 = ☐ **h** 112 – 109 = ☐ **i** 201 – 196 = ☐

2 **Use counting on to complete these function machines.**

a

In	Rule	Out
41	– 37	
44		
42		
45		

b

In	Rule	Out
71	– 68	
73		
75		
72		

c

In	Rule	Out
122	– 119	
125		
124		
123		

d

In	Rule	Out
101	– 98	
105		
107		
103		

e

In	Rule	Out
96	– 89	
93		
92		
94		

Subtraction mental strategies – counting on

3 **Complete each table of subtraction facts by counting on.**

a **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 **Table 1**

	– 38 = 4
	– 19 = 4
	– 47 = 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 156 – ☐ = △

b 76 – ☐ = △

c 283 – ☐ = △

d 91 – ☐ = △

e 292 – ☐ = △

f 100 – ☐ = △

g 48 – ☐ = △

h 90 – ☐ = △

i 93 – ☐ = △

j 200 – ☐ = △

k 86 – ☐ = △

l 94 – ☐ = △

Subtraction mental strategies – doubles and near doubles

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

5 + 5 = 10 so 10 – 5 = 5

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

a	6	+	6	=		so		–		=	
b	9	+	9	=		so		–		=	
c	12	+	12	=		so		–		=	
d	8	+	8	=		so		–		=	

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

1	2	3	4	5	6	7	8	9	10	11	12

Subtraction mental strategies – doubles and near doubles

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

See: 15 – 7	See: 13 – 7
Think: (14 – 7) + 1	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 –1.**

+	0	1	2	3	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		

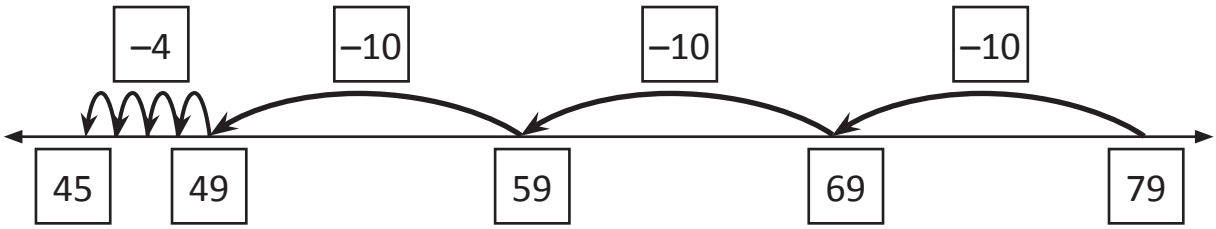
See	Think	Answer
3 – 2	*(4 – 2) – 1*	*1*
5 – 3		
7 – 4		
9 – 5		
11 – 6		

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 – jump strategy

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



1 **Subtract these using the jump strategy:**

a 78 – 25 = ☐

b 93 – 31 = ☐

c 84 – 21 = ☐

d 79 – 36 = ☐

e 195 – 42 = ☐

Subtraction mental strategies – 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: ☐

b The Sommers family has saved £34.

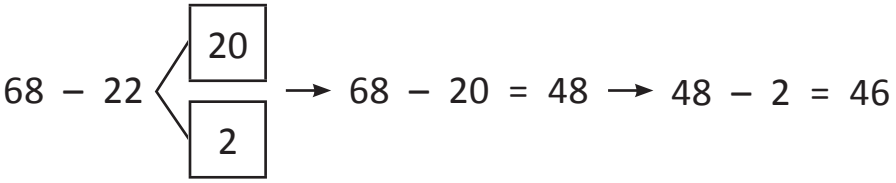
They need another: ☐

c The Griffiths family has saved £49.

They need another: ☐

Subtraction mental strategies – 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.



1 **Practise subtracting tens from these numbers:**

–	10	30	20	30	50
96					
71					

2 **Use the split strategy with these problems:**

a 73 – 34

b 96 – 65

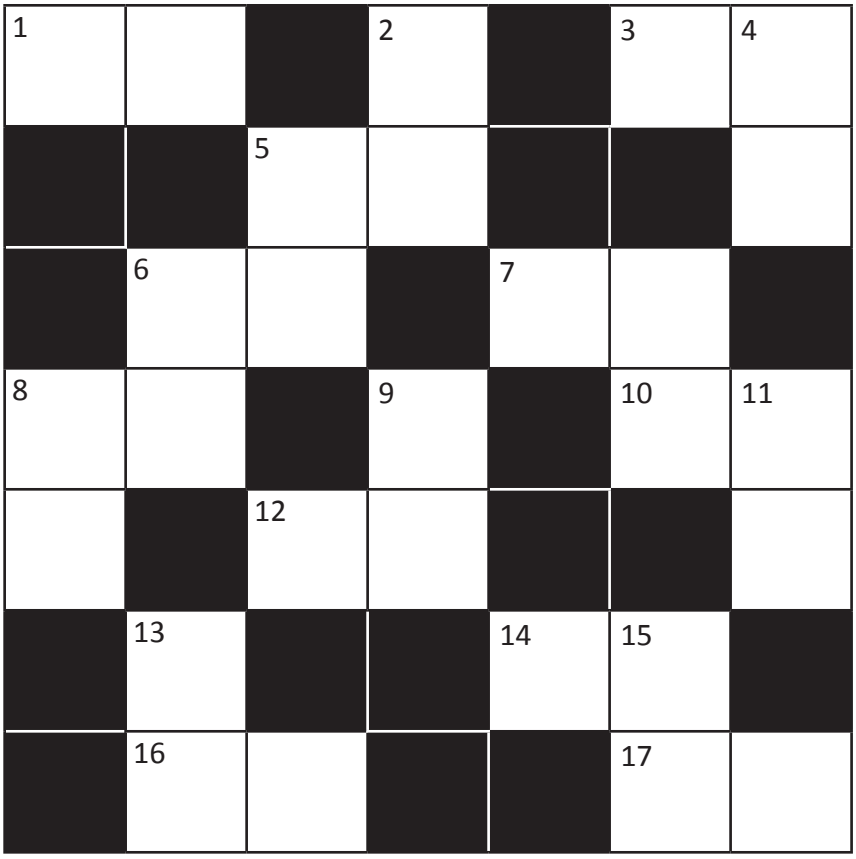
c 81 – 24

d 69 – 23

e 106 – 43

Subtraction mental strategies – split strategy

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



Across

1 50 – 18 = ☐

3 100 – 43 = ☐

5 135 – 45 = ☐

6 70 – 12 = ☐

7 87 – 23 = ☐

8 86 – 33 = ☐

10 78 – 53 = ☐

12 64 – 16 = ☐

14 72 – 36 = ☐

16 105 – 43 = ☐

17 160 – 117 = ☐

Down

2 88 – 68 = ☐

4 128 – 56 = ☐

5 200 – 102 = ☐

6 89 – 36 = ☐

8 88 – 32 = ☐

9 150 – 112 = ☐

11 160 – 101 = ☐

13 133 – 57 = ☐

15 99 – 35 = ☐

Lowest score

apply

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.

What to do

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.

Player 1

Number on die	Number used	Running score
Finishing score		

Player 2

Number on die	Number used	Running score
Finishing score		

Subtract from 100

apply

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

copy

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

Written methods – addition to 999, no exchanging

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

42 + 31 = (4 tens + 3 tens) + (2 ones + 1 one)
= 7 tens + 3 ones
= 73

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

	tens	ones
	4	2
+	3	1
	7	3

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

a 55 + 23 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

	tens	ones
	5	5
+	2	3

b 42 + 35 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

	tens	ones
+		

c 61 + 18 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

	tens	ones
+		

d 65 + 32 = (☐ tens + ☐ tens) + (☐ ones + ☐ ones)

= ☐ tens + ☐ ones

= ☐

	tens	ones
+		

Written methods – addition to 999, no exchanging

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

a

	tens	ones
	4	3
+	3	2

b

	tens	ones
	1	0
+	4	9

c

	tens	ones
	3	6
+	5	2

d

	tens	ones
	6	4
+		5

e

	tens	ones
	3	3
+	1	4

f

	tens	ones
	9	2
+		6

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

a

	tens	ones
	3	0
	2	1
+	2	6

b

	tens	ones
	3	4
	4	1
+	2	3

c

	tens	ones
	2	3
	3	5
+	3	0

4 **Write the missing digits in these problems:**

a

	tens	ones
	2	☐
	☐	2
+	4	1
	9	6

b

	tens	ones
	☐	3
	2	☐
+	1	2
	7	8

c

	tens	ones
	2	☐
	3	2
+	☐	5
	9	8

Written methods – addition to 999, no exchanging

5 **Now try adding 2- and 3-digit numbers to a 3-digit number.**

a

	hundreds	tens	ones
	1	4	2
+		3	6

b

	hundreds	tens	ones
	2	0	7
+		8	2

c

	hundreds	tens	ones
	7	1	6
+		7	3

d

	hundreds	tens	ones
	5	5	5
+		4	1

e

	hundreds	tens	ones
	1	4	7
+	1	5	2

f

	hundreds	tens	ones
	4	3	8
+			

6 **Write the missing digits in these problems:**

a

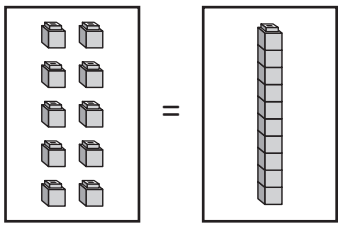
	hundreds	tens	ones
	2	☐	4
+	☐	5	☐
	3	6	7

b

	hundreds	tens	ones
	3	☐	☐
+	☐	6	1
	8	7	5

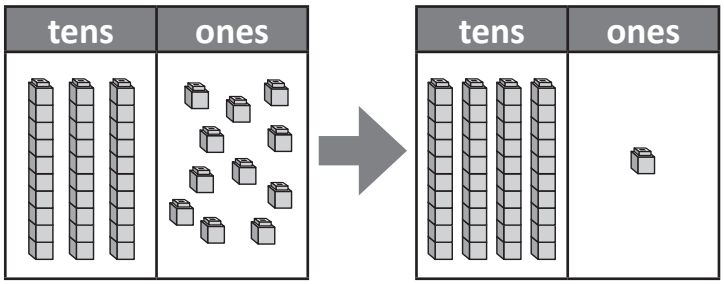
Written methods – addition to 999 with exchanging

Here is a place value board that shows how exchanging works. If we have 10 ones, we should exchange them for a ten.



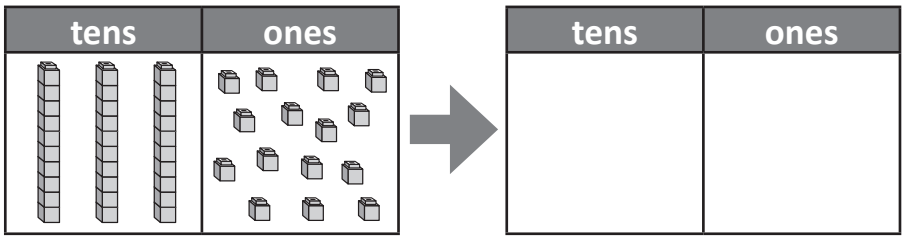
10 ones = 1 ten

On the first place value board we can see that there are 3 tens and 11 ones. If we exchange 10 ones for 1 ten and we get 4 tens and 1 one.

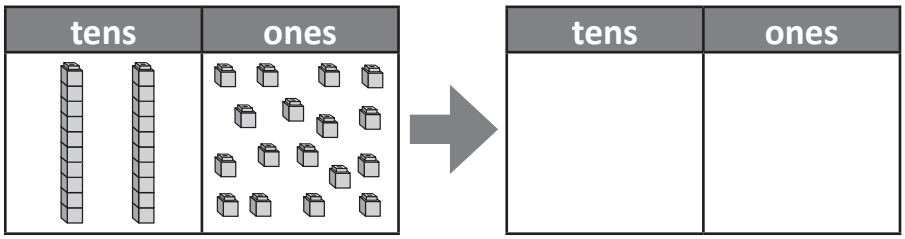


1 **For each set of place value boards, exchange the ones and show the exchanged amount on the next board. Just use straight lines for tens (longs) and squares for ones (shorts).**

a

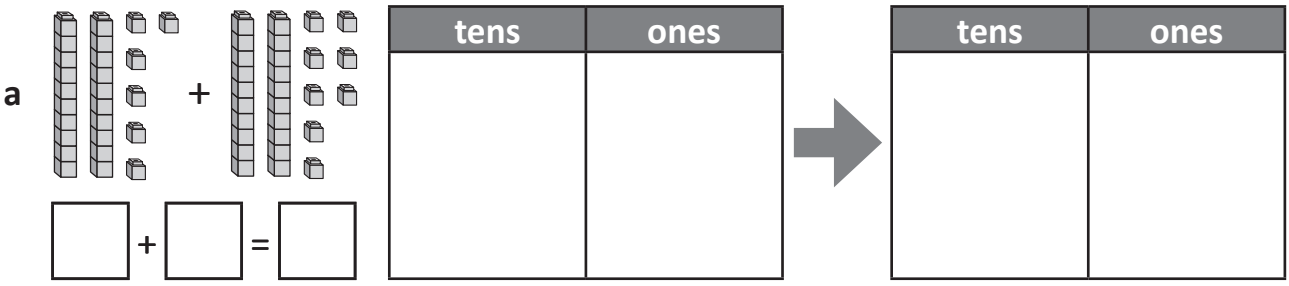


b

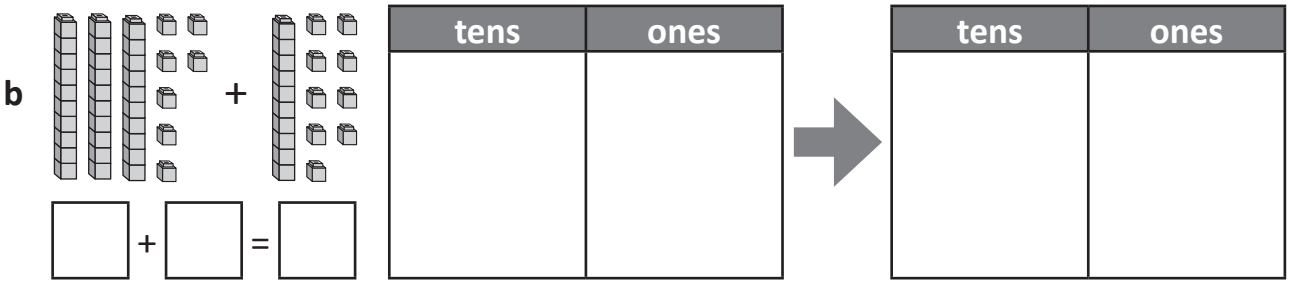


2 **Add the numbers shown in longs and shorts. Use the first place value board to show the longs and shorts combined and exchange them on the second board. Record the addition problem in the squares:**

a



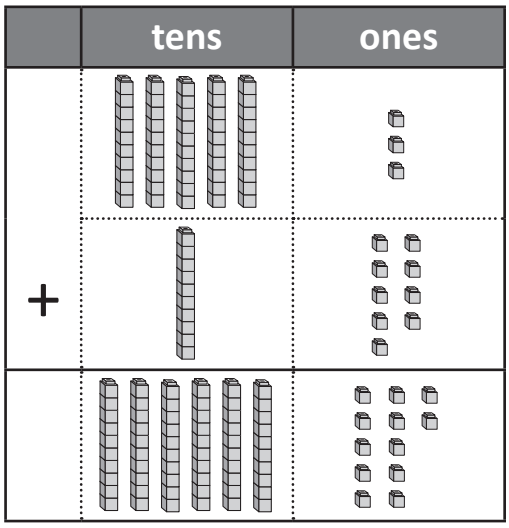
b



Written methods – addition to 999 with exchanging

Now that you have practised exchanging 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 exchange and regroup the tens and ones to get the answer 72.

Now look at the written method for addition when:

e: 70

	tens	ones
	5	3
+	1	9
	7	2
	1	

First, estimate the answer:
50 + 20 = 70. You estimate by rounding to the nearest 10.

Add the ones: 3 + 9 = 12
Think of this as 1 ten and 2 ones.

Write the 2 in the ones 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 2-digit numbers using the written method. Start by writing your estimate:**

a **e:**

	tens	ones
	3	8
+	2	9

b **e:**

	tens	ones
	4	9
+	2	7

c **e:**

	tens	ones
	2	9
+	4	9

Continued on page 36.

Written methods – addition to 999 with exchanging

Continued from page 35.

3 **Try adding these 2-digit numbers using the written method. Start by writing your estimate:**

d **e:**

	tens	ones
	4	4
+	1	7

e **e:**

	tens	ones
	4	9
+	4	3

f **e:**

	tens	ones
	1	9
+	6	2

g **e:**

	tens	ones
	4	8
+	1	8

h **e:**

	tens	ones
	3	8
+	2	9

i **e:**

	tens	ones
	1	9
+	5	9

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?

e:

	tens	ones
	3	9
+	5	8

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?

e:

	tens	ones
	1	9
+	5	9

Written methods – addition to 999 with exchanging

5 **Add these 2- and 3-digit numbers to a 3-digit number. Estimate first:**

a **e:**

	hundreds	tens	ones
	1	4	6
+		3	5

b **e:**

	hundreds	tens	ones
	2	3	7
+		5	5

c **e:**

	hundreds	tens	ones
	4	7	5
+		4	8

d **e:**

	hundreds	tens	ones
	7	9	2
+		2	9

e **e:**

	hundreds	tens	ones
	3	8	3
+	2	4	7

f **e:**

	hundreds	tens	ones
	5	1	4
+	2	9	9

g **e:**

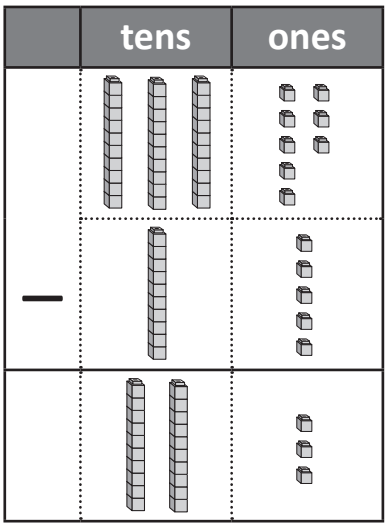
	thousands	hundreds	tens	ones
		6	7	5
		3	4	3
+			6	6

h **e:**

	thousands	hundreds	tens	ones
		7	5	8
		4	7	6
+			4	9

Written methods – subtraction to 999, no exchanging

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



	tens	ones
	3	8
–	1	5
	2	3

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

a

	tens	ones
	6	3
–	3	2

b

	tens	ones
	8	7
–	4	3

c

	tens	ones
	7	7
–	5	3

d

	tens	ones
	5	8
–	4	2

e

	tens	ones
	7	8
–	3	2

f

	tens	ones
	6	8
–	3	5

g

	hundreds	tens	ones
	1	5	2
–		4	1

h

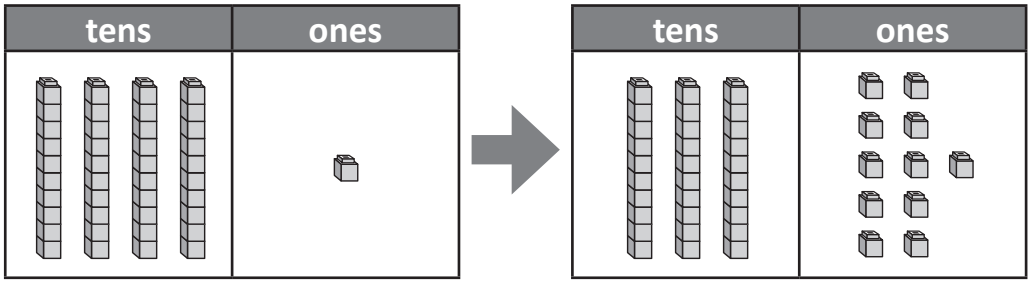
	hundreds	tens	ones
	3	7	6
–		3	4

i

	hundreds	tens	ones
	7	9	8
–	2	5	7

Written methods – subtraction to 999 with exchanging

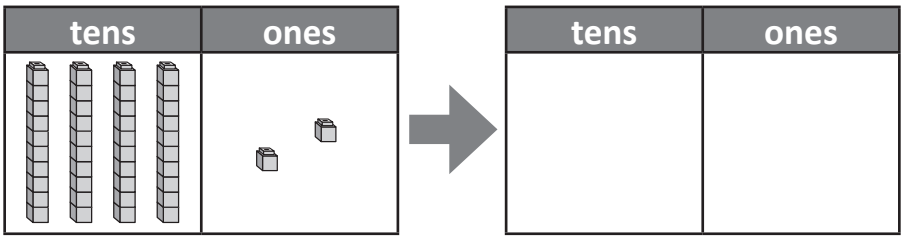
These place value boards show how we can exchange a ten for ones.



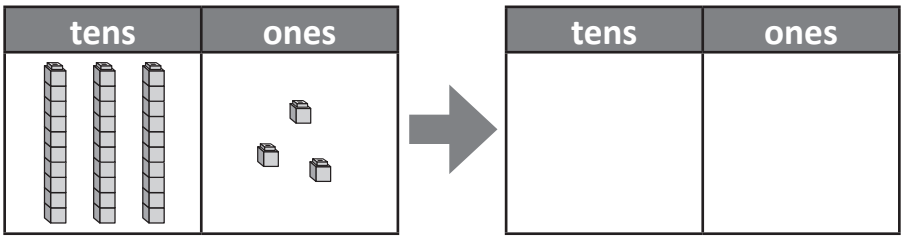
4 tens and 1 one is now 3 tens and 11 ones.

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

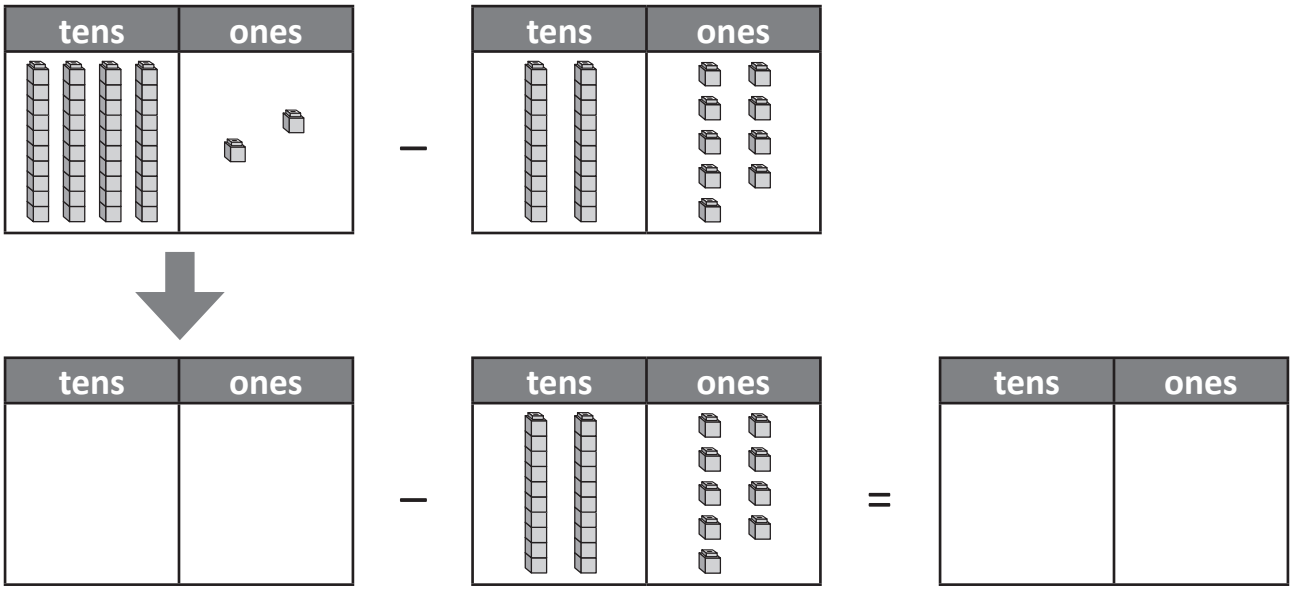
a



b



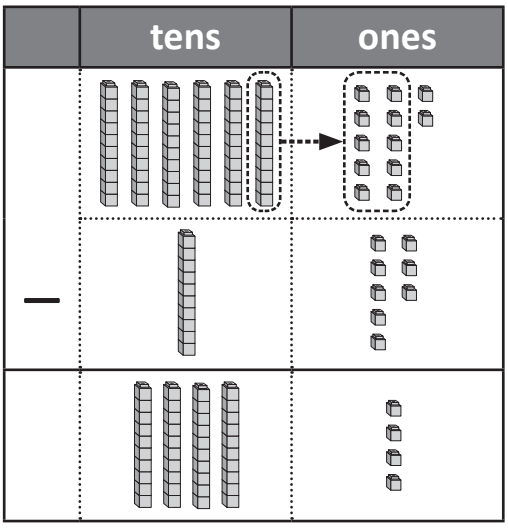
2 **Complete this subtraction problem shown in longs and shorts. Exchange a ten for ones and then subtract. Show your answer in longs and shorts:**



Written methods – subtraction to 999 with exchanging

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

Here is 62 – 18 shown in longs and shorts.
If we exchange a ten into ones, we can now subtract the ones.



Now look at the written method for subtraction when exchanging.

e: 40

	tens	ones
	5 ~~6~~	1 2
–	1	8
	4	4

First, estimate the answer:
60 – 20 = 40. You estimate by rounding to the nearest 10.

Look at the ones. We can't subtract 8 from 2, so we exchange a ten for 10 ones.

We now have 12 ones. 12 subtract 8 is 4, so we write 4 in the ones 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 exchanging. Start by writing your estimate:**

a **e:**

	tens	ones
	7	2
–	2	8

b **e:**

	tens	ones
	5	2
–	4	3

c **e:**

	tens	ones
	6	1
–	3	4

Continued on page 41.

Written methods – subtraction to 999 with exchanging

Continued from page 40.

3 **Complete these written subtraction problems with exchanging. Start by writing your estimate:**

d e: ____

	tens	ones
	5	6
–	1	8

e e: ____

	tens	ones
	6	2
–	3	3

f e: ____

	tens	ones
	9	6
–	2	8

g e: ____

	tens	ones
	4	1
–	2	4

h e: ____

	tens	ones
	7	6
–	3	9

i e: ____

	tens	ones
	9	7
–	6	8

4 **What is the digit behind the star?**

a

	tens	ones
	7	2
–	5	☆
	1	6

☆ = ____

b

	tens	ones
	8	☆
–	5	9
	2	5

☆ = ____

c

	tens	ones
	7	9
–	5	☆
	2	4

☆ = ____

Written methods – subtraction to 999 with exchanging

5 **Complete these written subtraction problems with exchanging. Start by writing your estimate:**

a e: _____

	hundreds	tens	ones
	1	7	4
–		3	5

b e: _____

	hundreds	tens	ones
	4	8	6
–		9	4

c e: _____

	hundreds	tens	ones
	2	3	2
–		6	7

d e: _____

	hundreds	tens	ones
	3	4	5
–	1	6	8

e e: _____

	hundreds	tens	ones
	6	5	3
–	5	7	7

f e: _____

	hundreds	tens	ones
	9	2	0
–	6	2	9

6 **Fill in the missing digit to these subtraction problems:**

a

	hundreds	tens	ones
	1	2	6
+		1	☐
	1	0	9

b

	hundreds	tens	ones
	3	☐	5
+	1	4	3
	1	8	2

Rolling subtraction

apply

Getting ready

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.

What to do

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	Number on die 2
	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

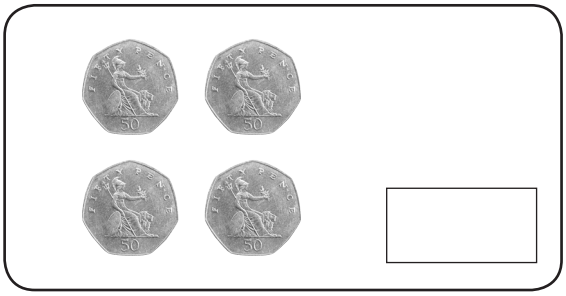
It is important to be able to recognise coins and add different combinations quickly.

1 **Label each of these coins:**

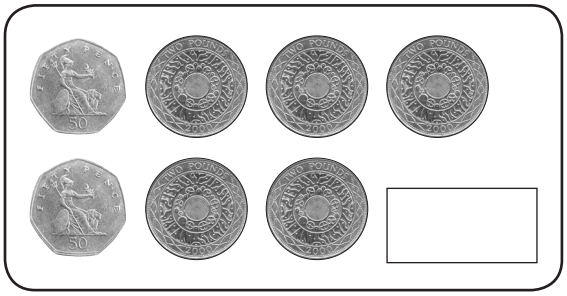
2 **Add each amount of coins:**

a

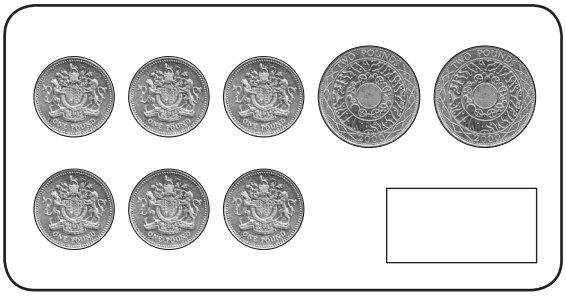
b



c



d

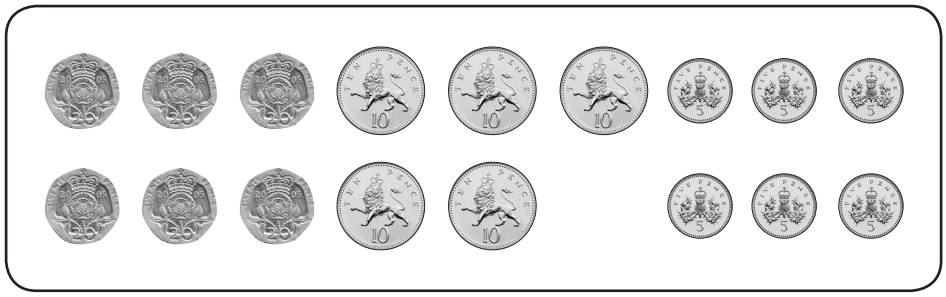


3 **Show £10 using a combination of all the coins in question 1.**

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

b Trade for £2

Amount left over

c Trade for £5

Amount left over

d Trade for £10

Amount left over

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.**

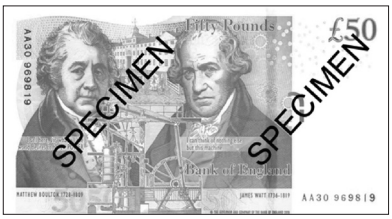
							
a	 Confetti **£1.60**		✓		✓✓✓		
b	 Balloons **£1.75**						
c	 Streamers **£2.40**						
d	 Glow sticks **£4.15**						
e	 Party hats **£3.25**						

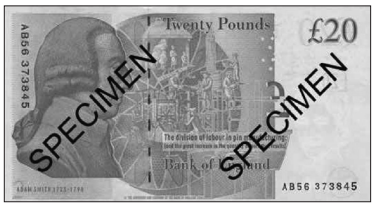
6 **You have this amount to spend:** 

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

Money – note combinations

These are the notes in our currency.





1 How much money is there?

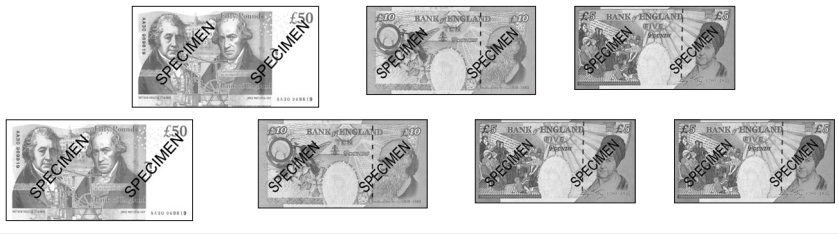
a

= £ ☐

b

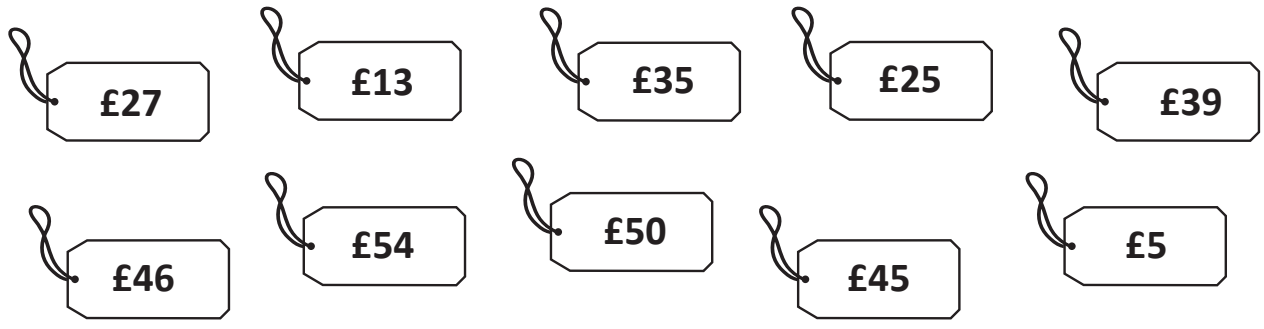
= £ ☐

c



= £ ☐

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



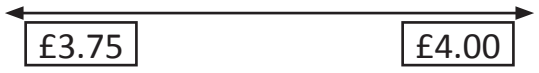
Money – finding change

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.

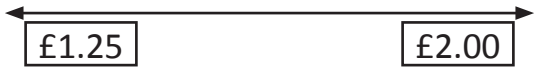
For example, if I buy some fruit that costs £2.85 with a £5.00 note, I would get back £2.15 in change. Bridge to the next pound and then add the rest.

1 **Practise bridging to the next pound:**

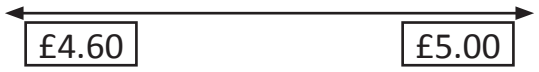
a



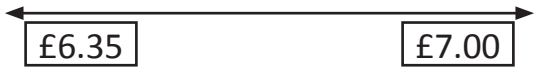
b



c



d



2 **Bridge to the next pound on these number lines to find the change:**

a

Change is: ☐

b

Change is: ☐

c

Change is: ☐

Money – adding pound 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?

Claim the totals

apply

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

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

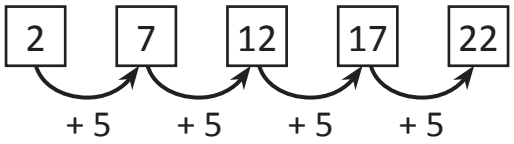
Claim the totals

apply

Patterns and algebra – completing and describing patterns

Skip counting in the hundred grid starting at zero, is a good way to begin looking at number patterns. Now let's look at number patterns that start at numbers bigger than zero.

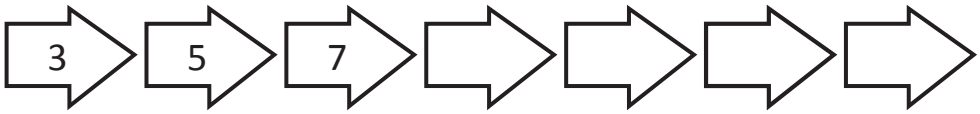
This pattern starts at 2.



The rule is: Add 5.

1 **Complete the missing numbers in each pattern:**

a Rule: Add 2



b Rule: Add 4

c Rule: Subtract 5

2 **Continue the pattern from the starting number:**

a	Add 10	11						
b	Add 5	55						
c	Subtract 4	40						

3 **Finish each pattern and write the rule:**

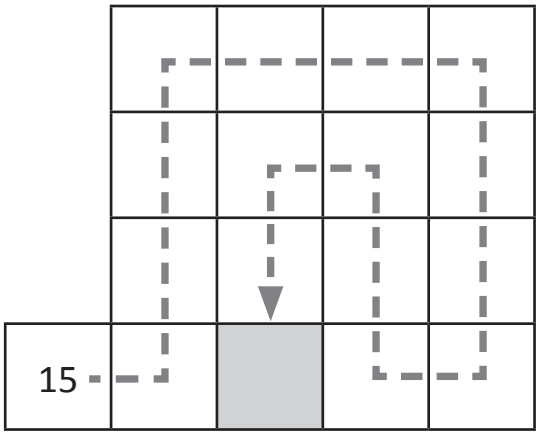
a 5, 8, 11, ___, ___, ___, ___, ___ Rule: ___

b 7, 14, 21, ___, ___, ___, ___, ___ Rule: ___

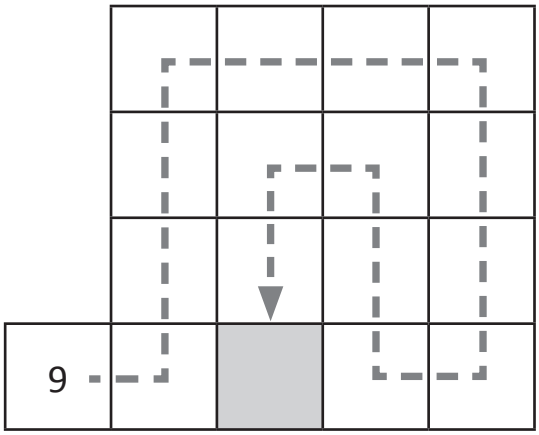
c 72, 63, 54, ___, ___, ___, ___, ___ Rule: ___

4 **Fill these snail grids with these patterns.**

a Skip count by 15:



b Skip count by 9:



5 **Check these patterns. They all have mistakes in them. Find the mistakes, circle them and write the corrections underneath.**

a

12	50	88	126	164	204	242	280

b

84	77	70	63	56	50	43	36

c

17	59	101	143	185	229	271	313

6 **Roll a set of dice to make a 2-digit number. This is the starting number. Write it in the first space. Then continue the sequence by following the rule.**

a Rule: + 10

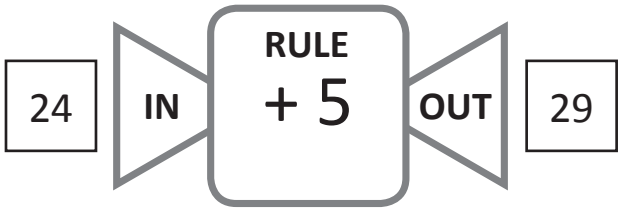
b Rule: + 3

c Rule: + 4

Patterns and algebra – function machines

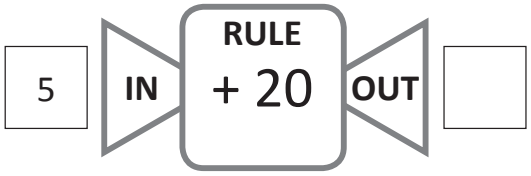
This is a function machine.

Numbers go in, have the rule applied, and come out again.

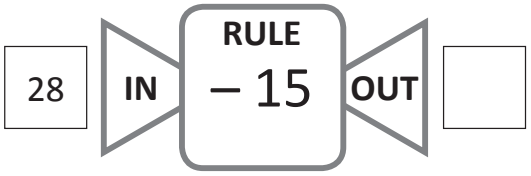


1 **What number will come out of these function machines?**

a

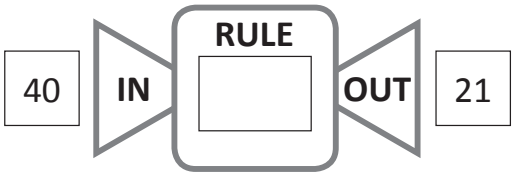


b

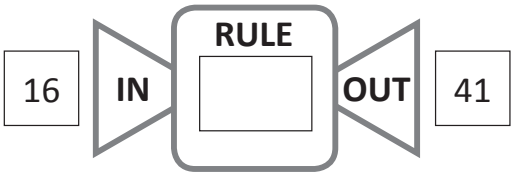


2 **Write the rule on these function machines:**

a

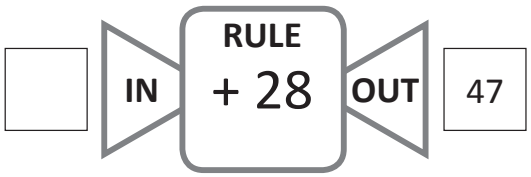


b

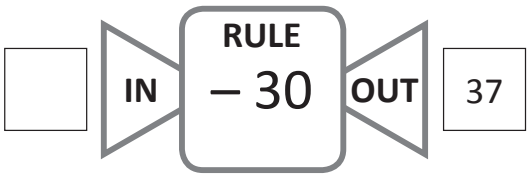


3 **What number will go in to these function machines?**

a

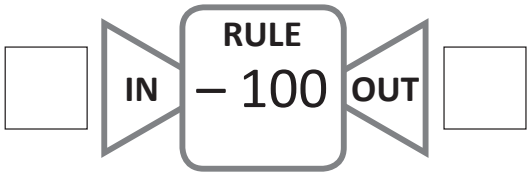


b

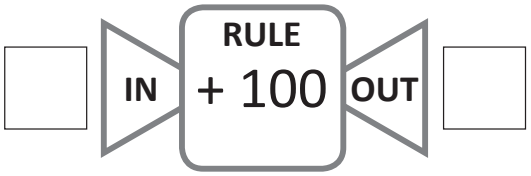


4 **Select a number to go in to these function machines. Then calculate a number that will come out:**

a



b

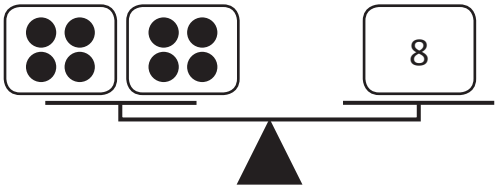


Patterns and algebra – introducing equations

Look at these balanced scales.

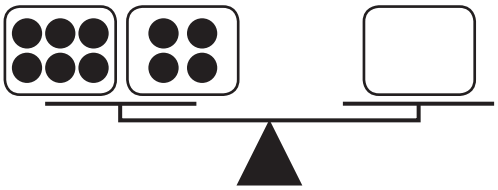
In each box on the left there are 4 dots and on the other side is the number 8.

This makes sense because it shows the equation 4 + 4 = 8. An equation is a sum with an equals symbol. One side must equal or balance the other just like these scales.



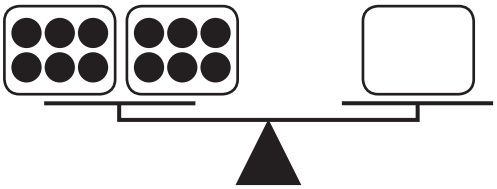
1 **Balance each set of scales by writing a number in the box. Then write the matching equation:**

a



☐ + ☐ = ☐

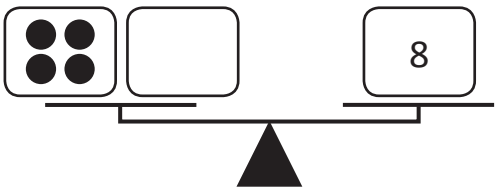
b



☐ + ☐ = ☐

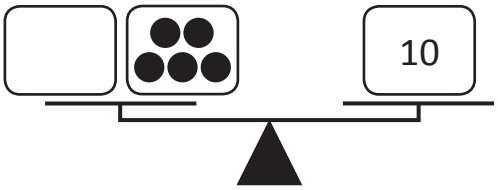
2 **Again, balance each set of scales but this time add the missing dots to the empty box:**

a



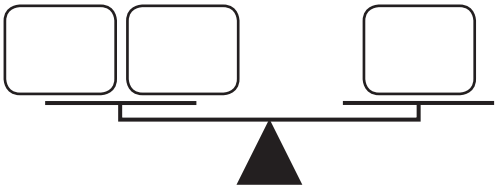
☐ + ☐ = ☐

b



☐ + ☐ = ☐

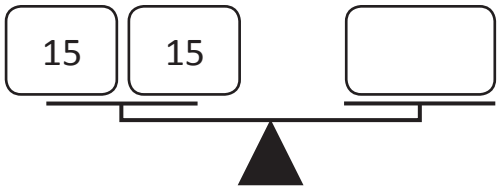
3 **This time, create your own equation and show it on the balanced scales:**



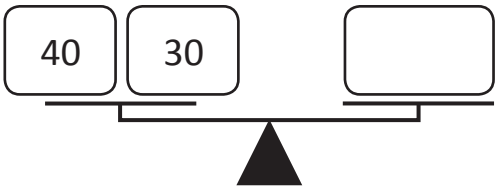
☐ + ☐ = ☐

4 **Balance each set of scales by writing the missing number in the box.**

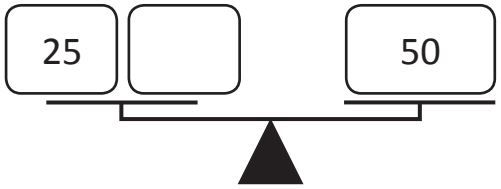
a



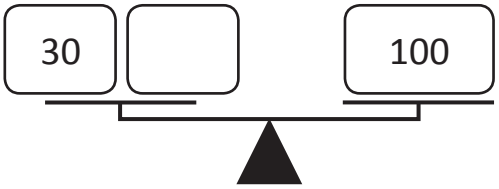
b



c

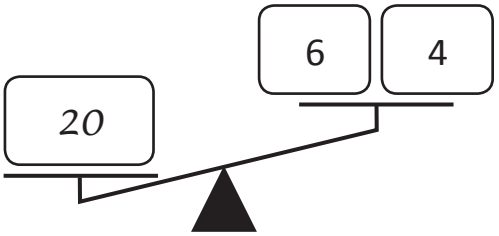


d

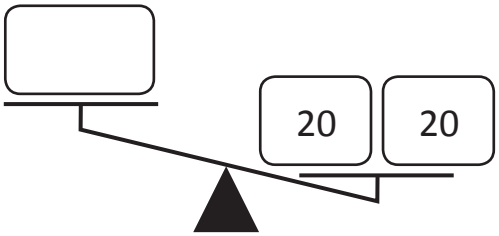


5 **These scales are not balanced. This shows that the equation is not equal. One side is greater than the other. Write a number in the box to make these true. The first one has been done for you.**

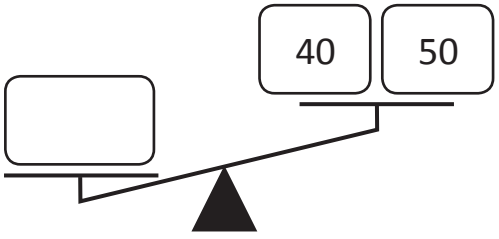
a



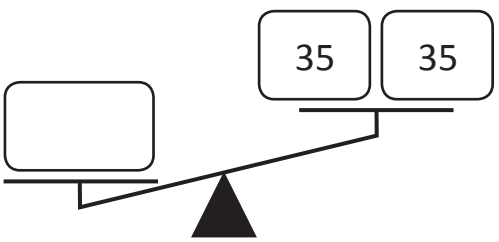
b



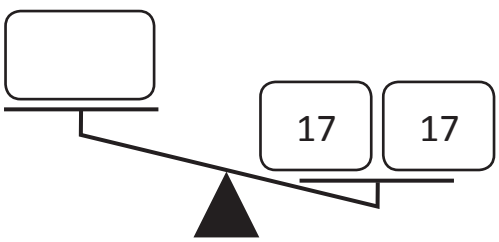
c



d

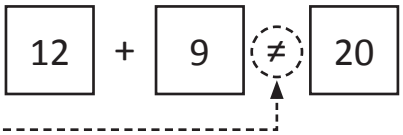


e



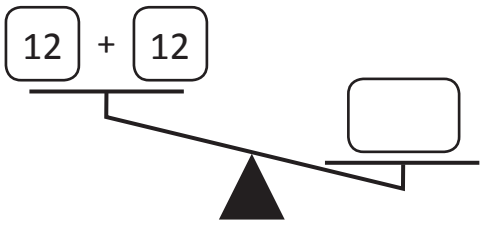
Patterns and algebra – not equal to symbol

When two sides of an equation are not balanced, it means that they are not equal. To show that an equation is not equal, we use the not equals symbol like this:



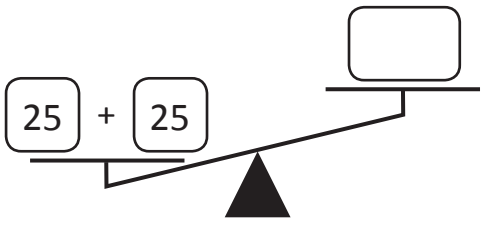
1 **Balance each set of scales by writing a number in the box. Then write the matching equation.**

a



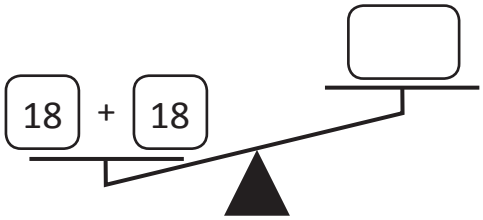
12 + 12 ≠ ☐

b



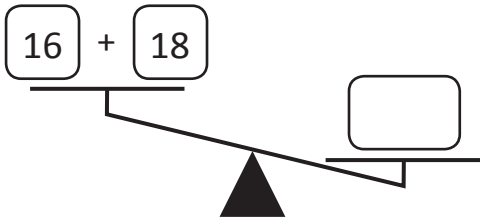
☐ + ☐ ≠ ☐

c



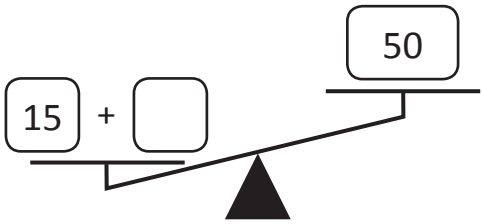
☐ + ☐ ≠ ☐

d



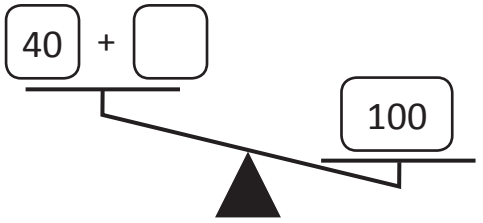
☐ + ☐ ≠ ☐

e



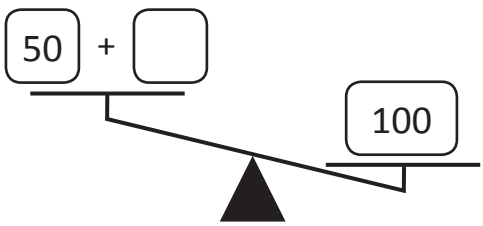
☐ + ☐ ≠ ☐

f



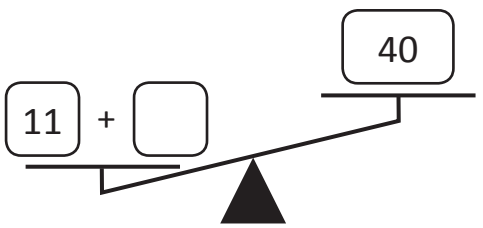
☐ + ☐ ≠ ☐

g



☐ + ☐ ≠ ☐

h



☐ + ☐ ≠ ☐

Patterns and algebra – not equal to symbol

2 **Practise using the *equals to* (=) or *not equals to* (≠) symbol in these problems. Roll 2 dice and write the number in each box. Then, make the equation true by either writing = or ≠ in the circle.**

a ☐ + ☐ ◯ 12

b ☐ + ☐ ◯ 6

c ☐ + ☐ ◯ 8

d ☐ + ☐ ◯ 12

e ☐ + ☐ ◯ 10

f ☐ + ☐ ◯ 7

3 **Complete the equations below only using the numbers in the cards. Look carefully to see whether it is = or ≠ .**

16	20	4	10	7	3

a ☐ + ☐ = ☐

b ☐ + ☐ ≠ ☐

c ☐ + ☐ = ☐

d ☐ + ☐ ≠ ☐

4 **Roll a die and write the number in any star that balances the equation. Your aim is to balance as many equations as you can out of 6 rolls of the die. For numbers that do not balance the equations, use an ≠ symbol.**

a 6 + ☆ ☐ 10

b 5 + ☆ ☐ 9

c 9 + ☆ ☐ 12

d 11 + ☆ ☐ 15

e 3 + ☆ ☐ 6

f 4 + ☆ ☐ 8

g How did you go? _____