Mathletics

Addition and Subtraction

My name

Series E – Addition and Subtraction

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Series E – Addition and Subtraction

Contents

Series Author:

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Addition mental strategies – number bonds

Two numbers that add together are called bonds.

12 and 8 are bonds to 20 because 12 + 8 = 20

35 and 65 are bonds to 100 because 35 + 65 = 100

1 **Circle the bonds in each set:**

a Bonds to 20. There are three to find. The first one has been done for you.
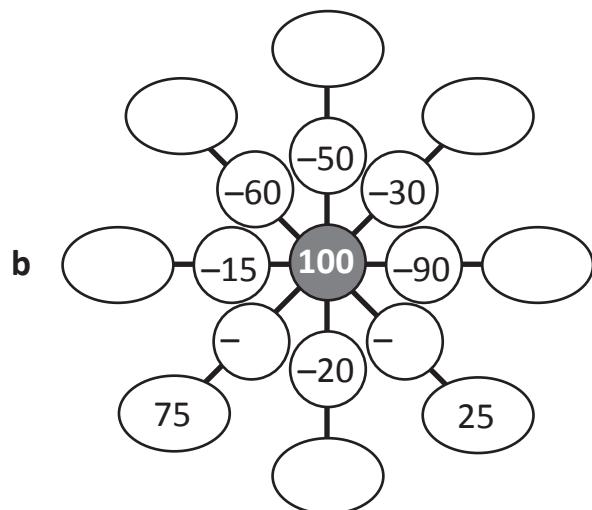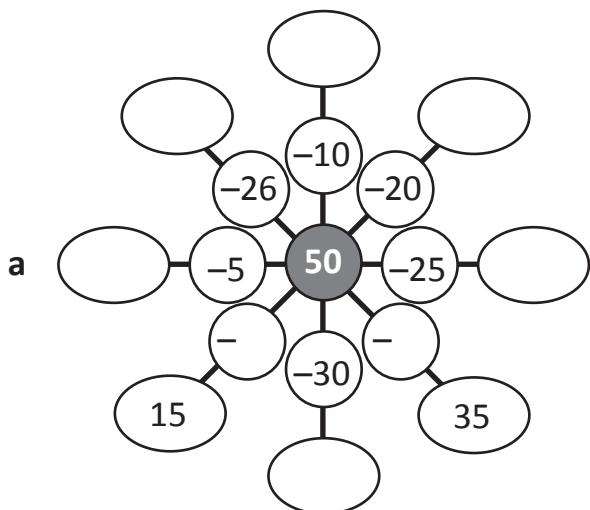
7	4	14
10	1	6
10	12	8

b Bonds to 50. There are eight to find:

26	12	30	20
24	38	15	35
17	45	5	40
33	18	32	10

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

a

Centre: **50**, with −10, −26, −20, −5, −25, −, −, −30, 15, 35

b

Centre: **100**, with −50, −60, −30, −15, −90, −, −, −20, 75, 25

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

a (80 + 20) + (15 + 5)   = *100 + 20 = 120*

b 18 + 2 + 30 + 20 + 10 + 10   = _____

c 25 + 25 + 40 + 30 + 20 + 10 = _____

d 15 + 35 + 20 + 30 + 10 + 12 = _____

Addition mental strategies – number bonds

4 **Complete the bonds to 50:**

a [   ] + 38 = 50

b [   ] + 17 = 50

c 25 + [   ] = 50

d 32 + [   ] = 50

e [   ] + 46 = 50

f [   ] + 28 = 50

g 14 + [   ] = 50

h 7 + [   ] = 50

---

5 **Complete the bonds to 100:**

a [   ] + 54 = 100

b [   ] + 22 = 100

c [   ] + 46 = 100

d 33 + [   ] = 100

e 62 + [   ] = 100

f 25 + [   ] = 100

g [   ] + 45 = 100

h [   ] + 48 = 100

---

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

a

		25		
45	5	**100**	5	
		25		

b

		15		
25		**100**		50
		25		

SERIES E   TOPIC 1

Addition and Subtraction

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.

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

See: $6 + 7$

Think: double $6 + 1$

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

+	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

a double 1 =

double 2 =

double 3 =

double 4 =

double 5 =

double 6 =

double 7 =

double 8 =

double 9 =

b double 1 + 1 =

double 2 + 1 =

double 3 + 1 =

double 4 + 1 =

double 5 + 1 =

double 6 + 1 =

double 7 + 1 =

double 8 + 1 =

double 9 + 1 =

c double 1 − 1 =

double 2 − 1 =

double 3 − 1 =

double 4 − 1 =
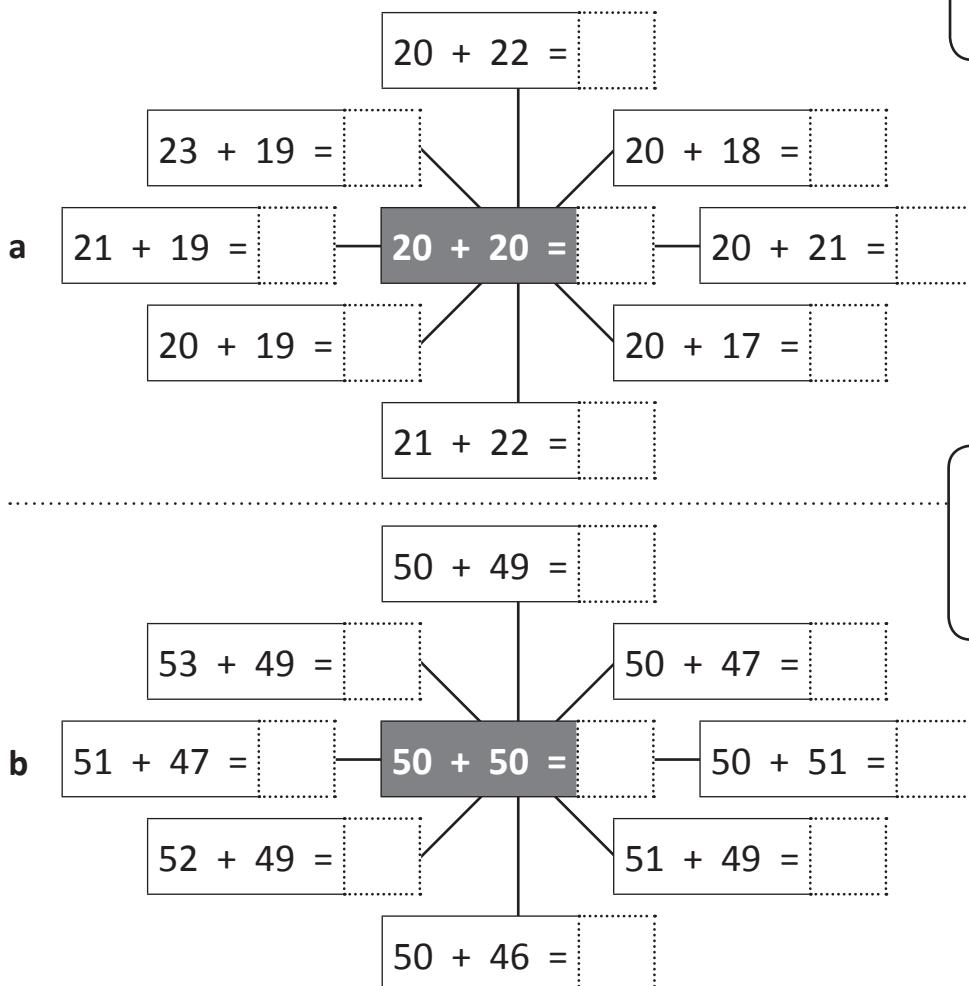
double 5 − 1 =

double 6 − 1 =

double 7 − 1 =

double 8 − 1 =

double 9 − 1 =

Addition mental strategies – doubles and near doubles

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

Start by looking at the first number.

For 21 + 18, think double 20 add 1 and then subtract 2 so the answer is 39.

a

20 + 22 =

23 + 19 =   20 + 18 =

21 + 19 =   **20 + 20 =**   20 + 21 =

20 + 19 =   20 + 17 =

21 + 22 =

Start by looking at the first number.

For 51 + 48, think double 50 add 1 and then subtract 2 so the answer is 99.

b

50 + 49 =

53 + 49 =   50 + 47 =

51 + 47 =   **50 + 50 =**   50 + 51 =

52 + 49 =   51 + 49 =

50 + 46 =

CHECK

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

a 30 + 32

b 25 + 23

c 100 + 97

Addition and Subtraction
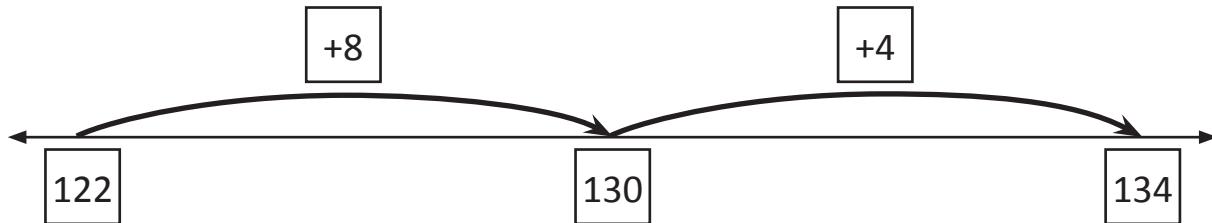
Addition mental strategies – bridge to ten

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

122 + 12 = 134

+8   +4

122   130   134

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

a 145 → +5 → *150*

b 243 →

c 558 →

d 167 →

e 346 →

f 179 →

....

2 Use the number lines to bridge to ten:

a 253 + 15 =

+   +

253

....
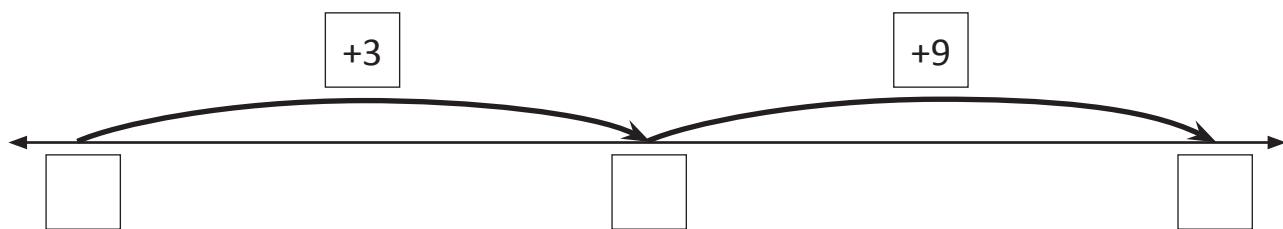
b 464 + 14 =

+   +

464

....

c 671 + 17 =

+   +

671

Addition and Subtraction
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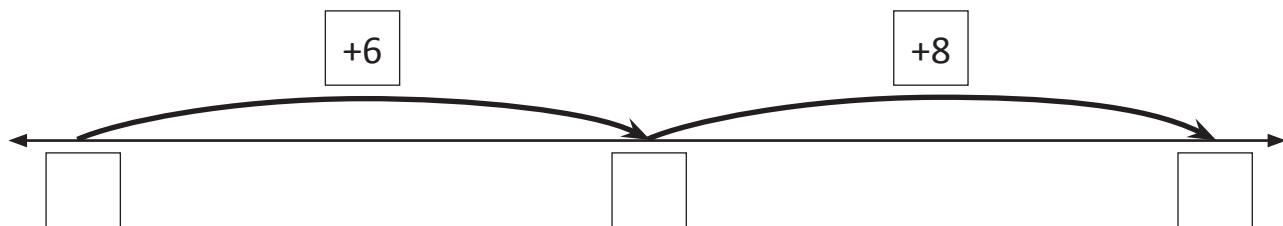
Addition mental strategies – bridge to ten

3 **Write a problem that matches the number line:**

a ☐ + ☐ = ☐

+3   +9

☐   ☐   ☐

b ☐ + ☐ = ☐

+6   +8

☐   ☐   ☐

c ☐ + ☐ = ☐

+4   +7

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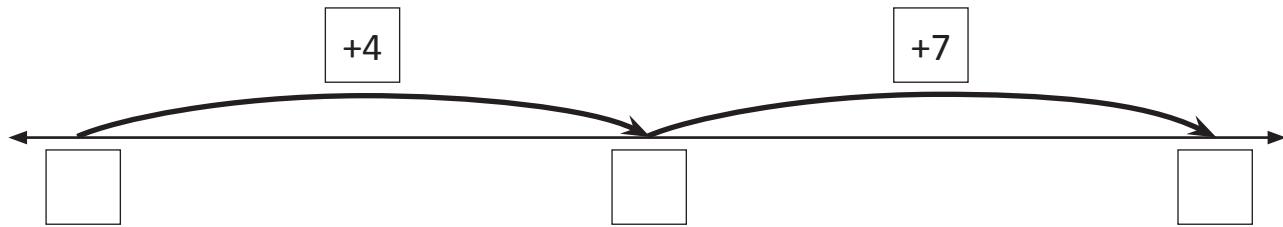
4 **Complete these addition grids by bridging to the next ten in your head:**
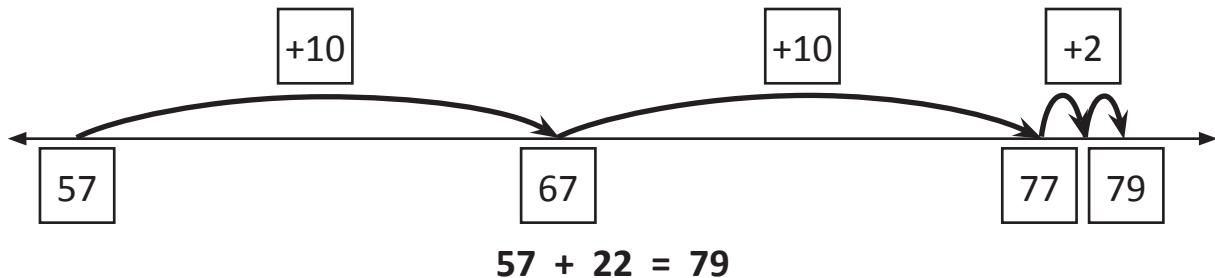
a

+	356	78	586	287	385	984
12						

b

+	298	566	252	176	368	146
16						
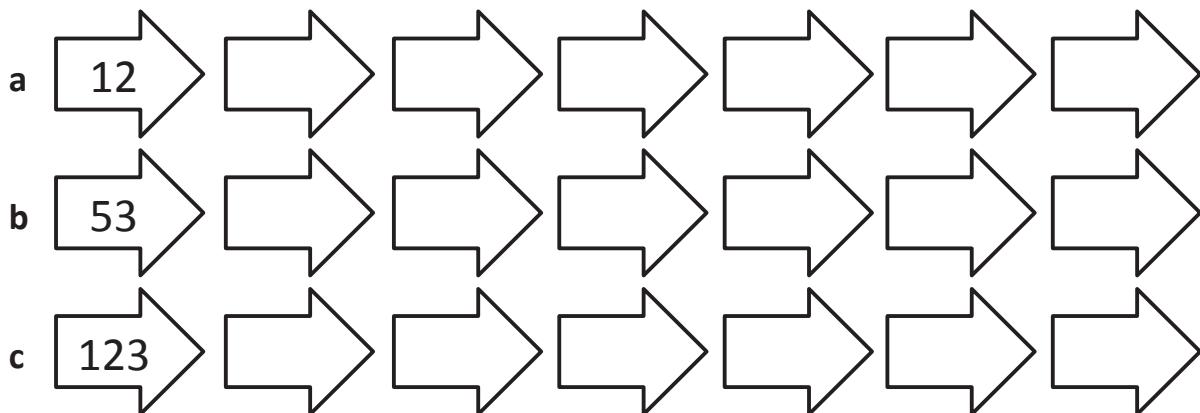
Addition mental strategies – jump strategy

When we add, we can use the jump strategy to help us. Look at 57 + 22:

1 First we jump up by the tens.

2 Then we jump up by the ones.

+10		+10		+2	

57		67		77	79

57 + 22 = 79

---

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

a 12

b 53

c 123

---

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

+10	+10	+10	+10	+10	+2

a 78 + 52 = ☐

78	88					

b 115 + 44 = ☐

c 185 + 63 = ☐
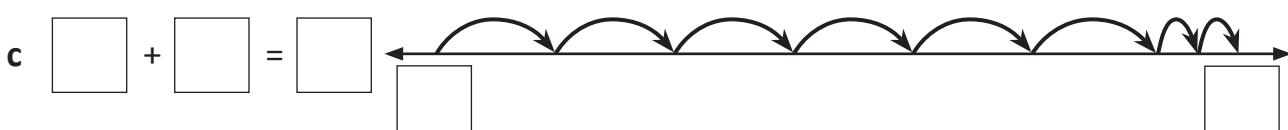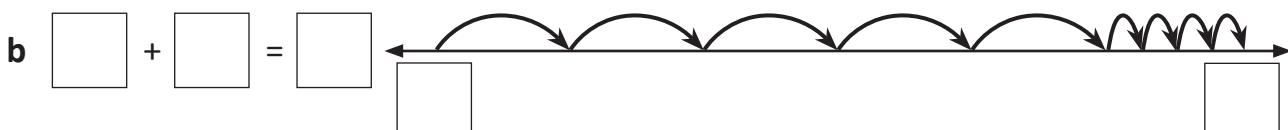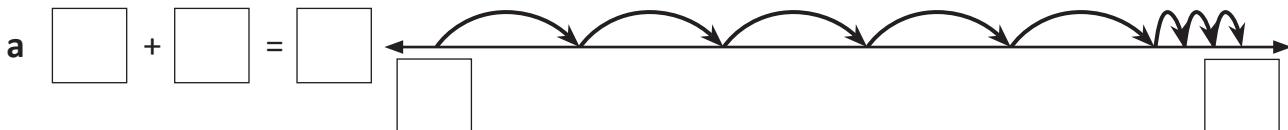
Addition mental strategies – jump strategy

3 **Below are some number lines that only show the jumps. Complete the number line for the problem that matches and then write the complete problem.**

| 187 + 54 | | 179 + 62 | | 78 + 53 |

a ☐ + ☐ = ☐

☐ _____ ☐

b ☐ + ☐ = ☐

☐ _____ ☐

c ☐ + ☐ = ☐

☐ _____ ☐
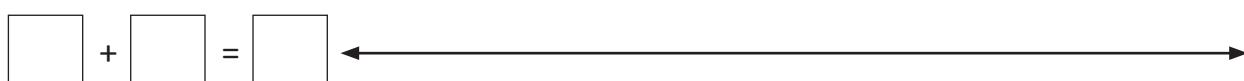
4 **Use the jump strategy to add these:**

Cupcake sales				
Day	Red velvet	Lemon drop	Coconut	Chocolate
Saturday	165	82	55	135
Sunday	43	98	65	36
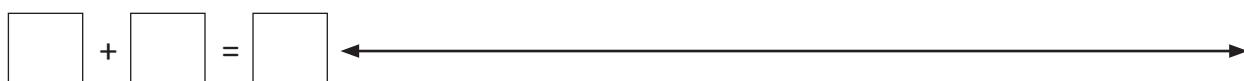
a How many red velvet cupcakes were sold over the weekend?

☐ + ☐ = ☐

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

☐ + ☐ = ☐

c How many chocolate cupcakes were sold over the weekend?

☐ + ☐ = ☐

Addition and Subtraction

Addition mental strategies – split strategy version 1

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

$$112 + 46 \begin{cases} 40 \\ 6 \end{cases} \longrightarrow 112 + 40 = 152 \longrightarrow 152 + 6 = 158$$

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

a 48 $\begin{cases} 40 \\ 8 \end{cases}$
b 63 $\begin{cases} \\ \end{cases}$
c 52 $\begin{cases} \\ \end{cases}$
d 27 $\begin{cases} \\ \end{cases}$

2 Practise adding the tens to these numbers:

+	20	50	30	70	60
123					
214					

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

a 48 + 53 $\begin{cases} 50 \\ 3 \end{cases}$ ⟶ 48 + 50 = 98 ⟶ 98 + 3 = 101

b 65 + 38 $\begin{cases} \\ \end{cases}$ ⟶ [ ] ⟶ [ ]

c 112 + 25 $\begin{cases} \\ \end{cases}$ ⟶ [ ] ⟶ [ ]

d 332 + 66 $\begin{cases} \\ \end{cases}$ ⟶ [ ] ⟶ [ ]

Addition mental strategies – split strategy version 2

Here is another way to use the split strategy.

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

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

a 63 + 37 = (☐ + ☐) + (☐ + ☐)
tens   tens   ones   ones

= ☐ + ☐
tens   ones

= ☐

b 88 + 23 = (☐ + ☐) + (☐ + ☐)
tens   tens   ones   ones

= ☐ + ☐
tens   ones

= ☐

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

c 56 + 15 = (☐ + ☐) + (☐ + ☐)
tens   tens   ones   ones

= ☐ + ☐
tens   ones

= ☐

REMEMBER

d 65 + 28 = (☐ + ☐) + (☐ + ☐)
tens   tens   ones   ones

= ☐ + ☐
tens   ones

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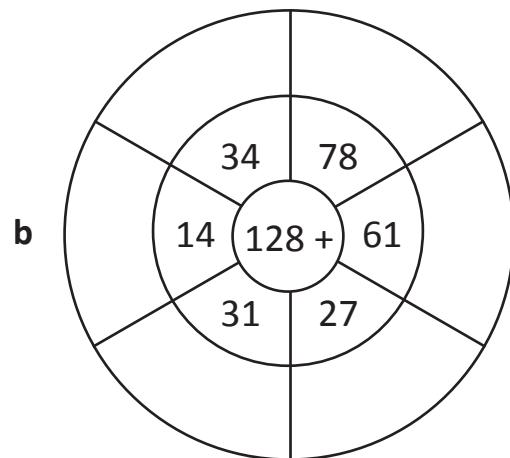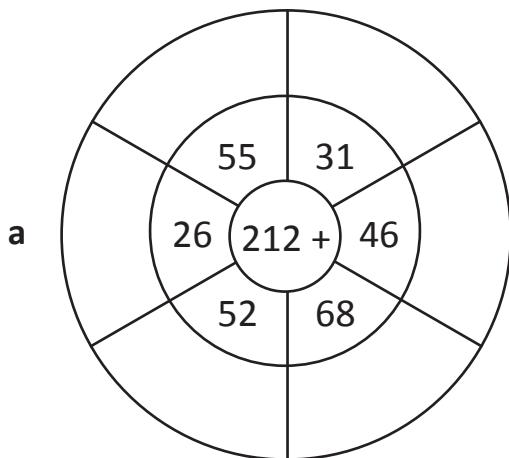
2 **Use either version of the split strategy to complete this table:**

+	23	78	63	55	36
45					
39					

Addition and Subtraction

Addition mental strategies – applying the split strategy

1 **Complete these addition wheels with the split strategy:**

a

55	31
26	(212 +)	46
52	68

b

34	78
14	(128 +)	61
31	27

The split strategy is useful when adding three 2-digit numbers.

Try adding tens, then the ones and recording it this way:

$$61 + 43 + 44 = 14 \text{ tens} + 8 \text{ ones} = 140 + 8 = 148$$

2 **Record these place value amounts:**

a 8 tens = ☐   **b** 17 tens = ☐   **c** 15 tens = ☐

d 5 ones = ☐   **e** 12 tens = ☐   **f** 16 ones = ☐

---

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

	Names	Time in seconds	Working	Total in seconds
a	Lizzie	22, 14, 3	*3 tens + 9 ones*	*39*
b	Dan	23, 4, 11		
c	Lily	21, 6, 14		
d	Jo	20, 8, 12		
e	Julio	4, 22, 12		

The winner is:

_____

Addition mental strategies – compensation strategy

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

$23 + 19 \quad = \boxed{42}$

$23 + 20 \; (-1) \qquad$ *I rounded up by 1,*

$43 \; (-1) \qquad = \quad 42 \quad$ *so I subtract 1.*

1 **Practise rounding:**

a $\boxed{148} \longrightarrow \boxed{}$ **b** $\boxed{39} \longrightarrow \boxed{}$ **c** $\boxed{47} \longrightarrow \boxed{}$

d $\boxed{109} \longrightarrow \boxed{}$ **e** $\boxed{96} \longrightarrow \boxed{}$ **f** $\boxed{199} \longrightarrow \boxed{}$

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

a $32 + 29 \qquad = \boxed{}$

$32 + 30 \quad \bigcirc$

$\underline{} \; \bigcirc = \boxed{}$

b $55 + 38 \qquad = \boxed{}$

$55 + 40 \quad \bigcirc$

$\underline{} \; \bigcirc = \boxed{}$

c $66 + 19 \qquad = \boxed{}$

$66 + \underline{} \quad \bigcirc$

$\underline{} \; \bigcirc = \boxed{}$

d $22 + 39 \qquad = \boxed{}$

$22 + \underline{} \quad \bigcirc$

$\underline{} \; \bigcirc = \boxed{}$

Addition and Subtraction

Addition mental strategies – compensation strategy

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

a 75 + 22 = ☐

75 + 20 ◯

_____ ◯ = ☐

b 45 + 41 = ☐

45 + 40 ◯

_____ ◯ = ☐
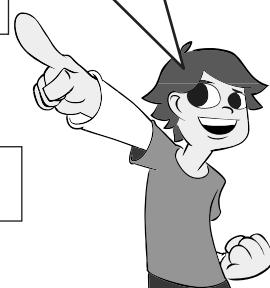
> When we round down we compensate by adding.
> When we round up we compensate by subtracting.

c 26 + 32 = ☐

26 + ___ ◯

_____ ◯ = ☐

d 66 + 53 = ☐

66 + ____ ◯

_____ ◯ = ☐

4 Use the compensation method to solve this riddle.

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

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

a 125 + 48 = ☐ A

b 115 + 41 = ☐ R

c 55 + 51 = ☐ C

d 715 + 28 = ☐ E

156   173   106   743   106   173   156

Getting ready

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

C copy

What to do

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

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

Ends in even number	1 point
Ends in odd number	2 points
Less than 50	5 points
Greater than 150	10 points
Multiple of 5	10 points
Between 120 and 140	5 points

□ □ + □ □ =

Addition and Subtraction
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9	8	7	6	5
4	3	2	1	9
9	8	7	6	5
4	3	2	1	9
4	3	2	1	9
4	3	2	1	9

Subtraction mental strategies – addition and subtraction

Knowing one addition fact means you also know two related subtraction facts.

Because 7 + 3 = 10 you know that 10 − 7 = 3 and 10 − 3 = 7

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

a | 15 | 35 |

15 + 35 = 50

50 − 15 = 35

50 − 35 = 15

b | 45 | 55 |

c | 73 | 27 |

d | 105 | 15 |

e | 120 | 10 |

f | 135 | 10 |

....

2 **Complete each number trail:**

a 150 $\xrightarrow{+\ 10}$ ☐ $\xrightarrow{-\ 15}$ ☐ $\xrightarrow{+\ 50}$ ☐ $\xrightarrow{+\ 30}$ ◯

b 200 $\xrightarrow{-\ 50}$ ☐ $\xrightarrow{+\ 25}$ ☐ $\xrightarrow{-\ 30}$ ☐ $\xrightarrow{+\ 55}$ ◯

c 99 $\xrightarrow{+\ 11}$ ☐ $\xrightarrow{+\ 50}$ ☐ $\xrightarrow{+\ 50}$ ☐ $\xrightarrow{-\ 20}$ ◯

d 76 $\xrightarrow{+\ 24}$ ☐ $\xrightarrow{+\ 35}$ ☐ $\xrightarrow{+\ 15}$ ☐ $\xrightarrow{-\ 25}$ ◯
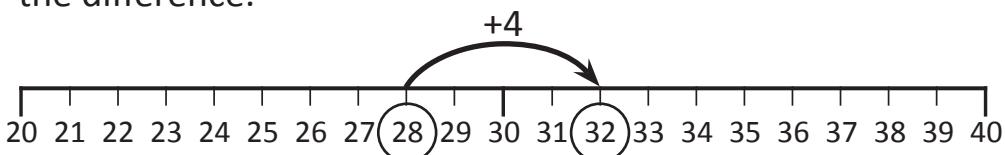
Subtraction mental strategies – subtraction strategy review

Look for patterns: $6 - 2 = 4$ so $60 - 20 = 40$ and $600 - 200 = 400$

$72 - 9 = 63$ so $62 - 9 = 53$ and $52 - 9 = 43$

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

+4

20 21 22 23 24 25 26 27 (28) 29 30 31 (32) 33 34 35 36 37 38 39 40

Bonds: $35 + 65 = 100$ so $100 - 35 = 65$

$12 + 8 = 20$ so $20 - 8 = 12$

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

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

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

Set 1

$17 - 9 = \boxed{}$

$27 - 9 = \boxed{}$

$37 - 9 = \boxed{}$

$47 - 9 = \boxed{}$

$57 - 9 = \boxed{}$

$67 - 9 = \boxed{}$

Set 2

$21 - 6 = \boxed{}$

$31 - 6 = \boxed{}$

$41 - 6 = \boxed{}$

$51 - 6 = \boxed{}$

$61 - 6 = \boxed{}$

$71 - 6 = \boxed{}$

2 **Extend these subtractions according to the patterns:**

a	$9 - 6 =$	$90 - 60 =$	$900 - 600 =$
b	$14 - 8 =$	$140 - 80 =$	$1,400 - 800 =$
c	$24 - 14 =$		
d	$69 - 32 =$		

Subtraction mental strategies – subtraction strategy review

3 **Use counting on to complete these:**

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 = ☐
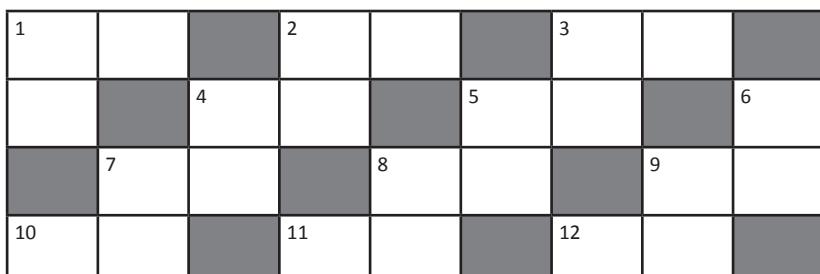
4 **Complete these function tables using counting on:**

a

In	Rule	Out
120		
123		
	− 118	
126		
124		

b

In	Rule	Out
102		
104		
	− 96	
108		
101		

c

In	Rule	Out
87		
81		
	− 78	
85		
83		

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

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

Across

1 100 − 80 = ☐

2 100 − 89 = ☐

3 100 − 5 = ☐

4 100 − 28 = ☐

5 100 − 22 = ☐

7 100 − 64 = ☐

8 100 − 49 = ☐

9 100 − 61 = ☐

10 100 − 52 = ☐

11 100 − 66 = ☐

12 100 − 75 = ☐

Down

1 100 − 78 = ☐

2 100 − 88 = ☐

3 100 − 2 = ☐

4 100 − 24 = ☐

5 100 − 29 = ☐

6 100 − 11 = ☐

7 100 − 62 = ☐

8 100 − 46 = ☐

9 100 − 65 = ☐

Subtraction mental strategies – subtraction strategy review

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

a

See	Think
$19 - 9 =$ ☐	$(18 - 9) + 1$
$201 - 100 =$ ☐	
$141 - 70 =$ ☐	
$71 - 35 =$ ☐	

b

See	Think
$15 - 8 =$ ☐	$(16 - 8) - 1$
$31 - 16 =$ ☐	
$99 - 50 =$ ☐	
$87 - 44 =$ ☐	

c

See	Think
$26 - 12 =$ ☐	$(24 - 12) + 2$
$52 - 25 =$ ☐	
$68 - 33 =$ ☐	
$104 - 51 =$ ☐	

d

See	Think
$24 - 13 =$ ☐	$(26 - 13) - 2$
$48 - 25 =$ ☐	
$70 - 36 =$ ☐	
$78 - 40 =$ ☐	

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

Start by looking at the first number.

For $99 - 51$, think $100 - 50$ subtract $2 = 48$
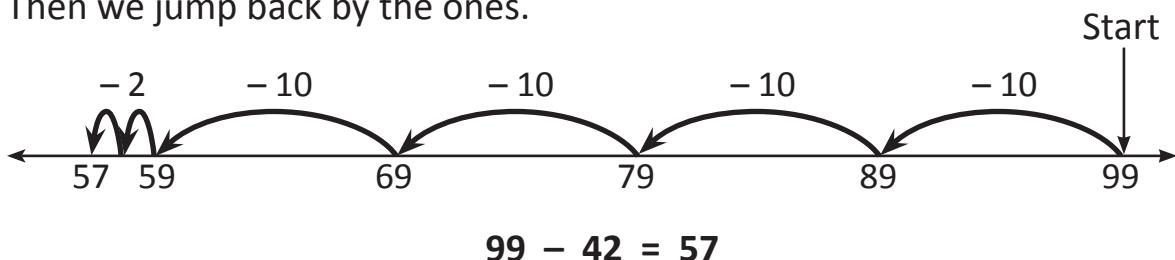
CHECK

$101 - 50 =$

$99 - 49 =$ $100 - 49 =$

$99 - 51 =$ **$100 - 50 =$** $100 - 51 =$

$98 - 50 =$ $99 - 50 =$

$97 - 50 =$

Subtraction mental strategies – jump strategy

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

1 First we jump back by the tens.

2 Then we jump back by the ones.

99 – 42 = 57

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

a 125 – 42 = ⬚

b 168 – 36 = ⬚

c 335 – 54 = ⬚

d 245 – 45 = ⬚

20

E 2

SERIES TOPIC

Addition and Subtraction

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Subtraction mental strategies – jump strategy

2 **It's stocktake time at Candilicious sweet shop. Use the jump strategy to work out how many of each type of sweet has been sold.**

Sweets	Started with	Amount left	Sold
Cinnamon drops	254	45	
Caramel melts	186	58	
Milk bottles	145	65	
Chocolate buttons	165	34	

a Cinnamon drops

☐ – ☐ = ☐

b Caramel melts

☐ – ☐ = ☐

c Milk bottles

☐ – ☐ = ☐

d Chocolate buttons

☐ – ☐ = ☐
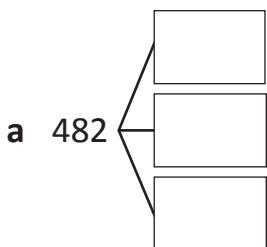
Subtraction mental strategies – split strategy
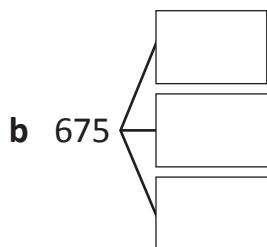
When subtracting large numbers in our heads it can be easier to split the number to be subtracted into parts and work with each part separately.
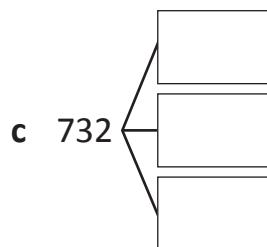
$255 - 132$ → 100, 30, 2 → $255 - 100 = 155$ → $155 - 30 = 125$ → $125 - 2 = 123$
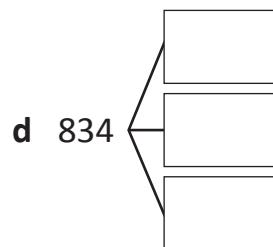
$255 - 132 = 123$

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

a 482

b 675

c 732
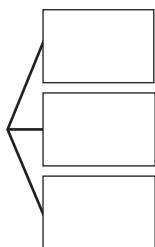
d 834
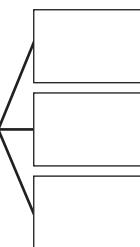
2 **Complete these subtraction trails:**

a 768 — -200 → ☐ — -20 → ☐ — -300 → ☐ — -10 → ◯

b 463 — -100 → ☐ — -50 → ☐ — -20 → ☐ — -50 → ◯

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

a $456 - 212$

b $378 - 165$

$456 - 200 =$ _____

$378 - 100 =$ _____

____ $- 10 =$ _____

____ $- 60 =$ _____

____ $- 2 =$ _____

____ $- 5 =$ _____

So, $456 - 212 =$ _____

So, $378 - 165 =$ _____

E SERIES   2 TOPIC

Addition and Subtraction

Subtraction mental strategies – split strategy

4 **Try these subtractions with the split strategy:**

a 479 − 45 = _____

So, 479 − 45 = _____

b 834 − 21 = _____

So, 834 − 21 = _____

c 637 − 312 = _____
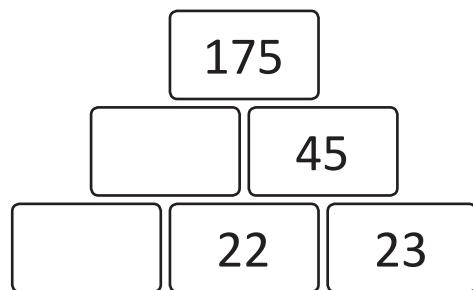
So, 637 − 312 = _____

d 567 − 232 = _____
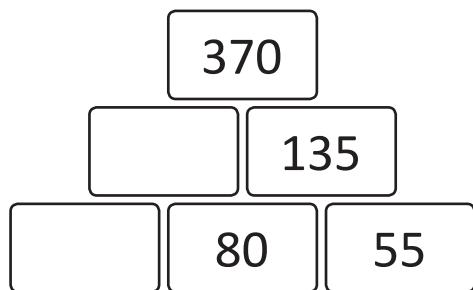
So, 567 − 232 = _____

5 **Solve these pyramid puzzles using any strategy you like. The two bricks add to support the number on top. For example in puzzle a, 22 + 23 = 45.**
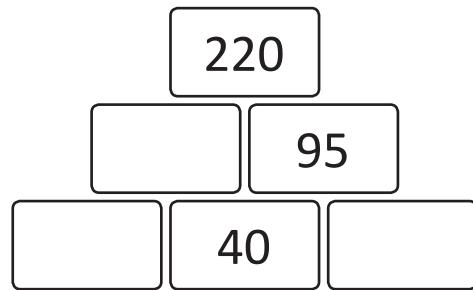
a
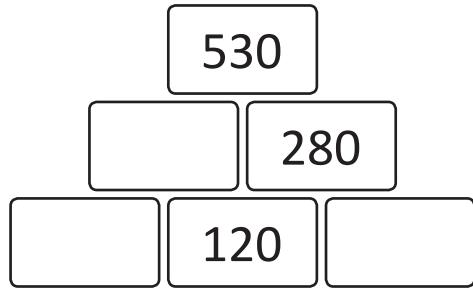
| 175 |
| 45 |
| 22 | 23 |

b

| 370 |
| 135 |
| 80 | 55 |

c

| 220 |
| 95 |
| 40 | |

d

| 530 |
| 280 |
| 120 | |

Subtraction mental strategies – compensation strategy

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

125 − 49   = ☐ 76

125 − 50 (+ 1)   *I rounded up by 1, which means I subtracted 1 extra so we need to add 1 back.*

75 (+ 1)   = 76

I took off 1 extra so I have to add 1 back.

THINK

---

1 **Round these numbers to the closest ten. Then show how you rounded by subtracting or adding the difference. The first one has been done for you.**

a 78 = _80 − 2_

b 59 = _____

c 62 = _____

d 23 = _____

e 87 = _____

f 99 = _____

g 103 = _____

h 21 = _____

i 88 = _____

---

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

a 136 − 29   = ☐

136 − 30 (+ 1)

_____ ( ) = _____

b 145 − 38   = ☐

145 − 40 (+ 2)

_____ ( ) = _____

c 156 − 39   = ☐

156 − ____ ( )

_____ ( ) = _____

d 184 − 48   = ☐

184 − ____ ( )

_____ ( ) = _____

Addition and Subtraction

Subtraction mental strategies – compensation strategy

Continued from page 24.

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

e   145 − 29   = [ ]

145 − 30   ( )

_____ − ( ) = _____

f   176 − 69   = [ ]

_____ ( )

_____ − ( ) = _____

g   365 − 42   = [ ]

_____ ( )

_____ − ( ) = _____

h   250 − 32   = [ ]

_____ ( )

_____ − ( ) = _____

3 Answer these subtraction problems to solve the riddle below:

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

a 65 − 29 = F   **b** 145 − 32 = U   **c** 175 − 61 = E

d 86 − 59 = O   **e** 180 − 48 = I   **f** 150 − 32 = N

g 96 − 42 = R   **h** 75 − 33 = G   **i** 155 − 49 = Y

j 166 − 55 = P   **k** 185 − 19 = T   **l** 370 − 28 = S

106   27   113   54

36   132   118   42   114   54   111   54   132   118   166   342

Subtraction mental strategies – estimating and inverse operations

When attempting to solve a calculation, it is always worth estimating what you expect the answer to be first. If you make an estimation, and then find that the answer you calculate is nowhere close to it, it is likely that you made a mistake somewhere.

For example, if I need work out 245 + 260, I can see that both numbers are quite close to 250. 250 + 250 = 500, so I can estimate that the answer will be near to 500. If I then calculate the answer to be 605, I can see I must have made an error and can recheck it.

Another important way of checking answers is using inverse operations. Addition and subtraction are inverse operations. This means that they are opposite operations – one reverses the effect of the other.

So, if 13 + 25 = 38, then I know that 38 − 25 = 13 and 38 − 13 = 25.

If 542 − 321 = 221, then 321 + 221 = 542 and 221 + 321 = 542

1 **Estimate the answers to these calculations before solving them and checking the answers using inverse operations.**

e: *110*

63 + 51 = *114*

114 − *51* = *63*

a e:

57 + 49 =

☐ − ☐ =

b e:

79 − 53 =

☐ + ☐ =

c e:

123 − 47 =

☐ + ☐ =

d e:

159 + 73 =

☐ − ☐ =

e e:

141 + 153 =

☐ − ☐ =

f e:

346 − 122 =

☐ + ☐ =

Addition and Subtraction

Getting ready → This is a game for two players. You will need a copy of this page and 25 counters between you.

C copy

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

Sample game:

Player 1 covers 20 with a counter and states the subtraction fact:
$100 - 20 = 80$

Player 2 covers 30 with a counter and states the next subtraction fact:
$80 - 30 = 50$

Player 1 then covers 50 and reaches zero first, so wins the round.

25	10	15	20	10
10	50	30	10	25
40	5	40	10	10
10	35	10	15	10
50	10	5	10	45

Subtraction grid puzzles

What to do → Complete these subtraction cross number puzzles:

a

125	–	75	=	
–		–		–
53	–		=	14
=		=		=
	–	36	=	

b

350	–	228	=	
–		–		–
165	–		=	54
=		=		=
	–	117	=	68

Addition and Subtraction
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Written methods – 3-digit addition with regrouping

e:	730

	H	T	O
	5	3	4
+	1	9	7
	7	3	1
		[1]	[1]

This is the written method for addition when regrouping.

First, estimate the answer to the nearest ten:
530 + 200 = 730

Add the ones: 4 + 7 = 11 ones.

Think of this as 1 ten and 1 one.

Write the 1 in the ones column and put the 1 in the tens column.

Add the tens: 3 + 9 + 1 = 13 tens.

Write 3 in the tens column and 1 in the hundreds column.

Add the hundreds: 5 + 1 + 1 = 7 hundreds.

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

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

	Question	Estimate		Question	Estimate
a	682 + 179	*680 + 180 = 860*	**b**	271 + 119	
c	359 + 222		**d**	378 + 119	
e	587 + 398		**f**	412 + 98	
g	189 + 108		**h**	911 + 207	

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

e:			

	H	T	O
a	3	5	4
+	2	1	7
		☐	☐

e:			

	H	T	O
b	6	2	8
+	2	1	3
		☐	☐

e:			

	H	T	O
c	3	6	4
+	2	2	8
		☐	☐

Written methods – 3-digit addition with regrouping

2   **Add these 3-digit numbers using the written method:**

e:

	H	T	O
d	2	6	3
+ 1	3	9
☐	☐	

e:

	H	T	O
e	3	4	4
+ 4	5	9
☐	☐	

e:

	Th	H	T	O
f		2	5	2
+		2	4	9
	☐	☐	☐

e:

	Th	H	T	O
g		2	6	2
+		5	4	9
	☐	☐	☐

e:

	Th	H	T	O
h		6	2	9
+		2	8	9
	☐	☐	☐

e:

	Th	H	T	O
i		3	4	9
+		3	8	7
	☐	☐	☐

3   **Solve these word problems using the written method:**
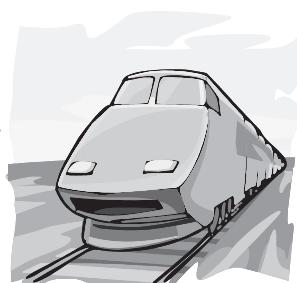
a   At a muffin shop, 456 banana choc chip muffins were sold on Saturday and 458 caramel chunk muffins were sold on Sunday. How many muffins were sold that weekend?

	H	T	O
+			
	☐	☐	

b   A train left the station with 389 people on board and then another 678 people got on over the next three stops. How many passengers were on the train altogether?

	Th	H	T	O
+				
	☐	☐	☐

E   3
SERIES   TOPIC

Addition and Subtraction

Written methods – 3-digit subtraction with regrouping

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

a
e:

	H	T	O
	6	5	2
−	3	2	7

b
e:

	H	T	O
	7	6	1
−	2	2	9

c
e:

	H	T	O
	5	9	2
−	4	4	8

You can use a piece of scrap paper to estimate your answer to the nearest 10.

CHECK

d
e:

	H	T	O
	5	8	2
−	3	4	6

e
e:

	H	T	O
	6	5	1
−	4	3	8

f
e:

	H	T	O
	9	6	2
−	6	4	9

g
e:

	H	T	O
	8	8	2
−	6	6	6

h
e:
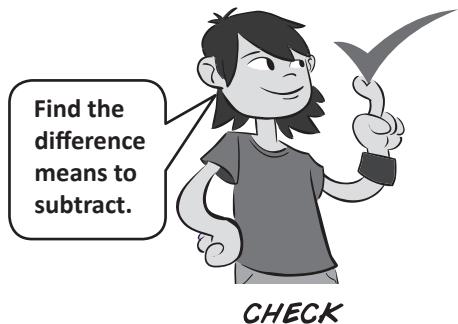
	H	T	O
	7	4	3
−	3	3	9

Written methods – 3-digit subtraction with regrouping

2 This sign shows the distances of towns along a highway from where the sign is. Find the difference between these places.

> Find the difference means to subtract.

CHECK

Showtown	971 km
Roper	893 km
Ringer	692 km
Eagle Bay	595 km
Normanville	567 km

a What is the distance between Ringer and Normanville?

	H	T	O
−			
			km

b What is the distance between Roper and Eagle Bay?

	H	T	O
−			
			km

c What is the distance between Showtown and Ringer?

	H	T	O
−			
			km

d What is the distance between Roper and Normanville?

	H	T	O
−			
			km

Written methods – 4-digit addition

1 **Add these 4-digit numbers:**

a
	Th	H	T	O
	3	3	5	3
+	1	0	2	1

b
	Th	H	T	O
	2	5	4	6
+	5	4	3	1

c
	Th	H	T	O
	4	5	2	4
+	2	1	6	4

d
	Th	H	T	O
	3	6	3	1
+	1	3	5	7

e
	Th	H	T	O
	1	2	5	2
+	5	3	3	3

f
	Th	H	T	O
	2	4	3	2
+	5	3	4	6

2 **Add these 4-digit numbers by regrouping:**

a
	Th	H	T	O
	6	6	3	8
+	1	2	3	6

b
	Th	H	T	O
	4	2	4	5
+	2	5	1	7

c
	Th	H	T	O
	3	4	2	9
+	1	1	3	9

3 **Add these 4-digit numbers by regrouping:**

a
	Th	H	T	O
	2	4	6	6
+	2	1	8	7

b
	Th	H	T	O
	3	1	8	7
+	3	0	5	9

c
	Th	H	T	O
	3	2	9	6
+	2	1	5	8

Written methods – 4-digit subtraction

1 **Subtract these 4-digit numbers:**

a
	Th	H	T	O
	6	4	9	3
−	3	2	7	1

b
	Th	H	T	O
	4	2	7	5
−	4	0	6	5

c
	Th	H	T	O
	8	4	7	9
−	3	4	5	6

d
	Th	H	T	O
	7	1	6	3
−	4	0	2	0

e
	Th	H	T	O
	3	2	9	8
−	3	0	6	4

f
	Th	H	T	O
	9	9	3	6
−	8	1	3	3

....

2 **Subtract these 4-digit numbers by regrouping:**

a
	Th	H	T	O
	5	4	3	6
−	3	3	1	8

b
	Th	H	T	O
	2	7	2	8
−	1	5	4	7

c
	Th	H	T	O
	6	3	4	7
−	2	6	1	5

d
	Th	H	T	O
	4	5	7	2
−	2	6	5	4

e
	Th	H	T	O
	9	3	1	4
−	8	1	5	7

f
	Th	H	T	O
	5	8	1	5
−	3	7	8	9

E SERIES   3 TOPIC

Addition and Subtraction

Written methods – addition and subtraction challenges

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

a | 4 | 3 | 9 |

```
      3   6   2
  +           7
  _____
      7   9
```

b | 8 | 3 | 3 | 2 |

```
              6   5
  -       4
  _____
          4       3
```

c | 6 | 5 | 1 |

```
          3
  +   2       3
  _____
      8   4   8
```

d | 3 | 6 | 7 |

```
          5
  -           2   4
  _____
      2   4   3
```

....

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

a
```
        ◆   3   ◆
  +     ◆   ◆   4
  _____
    1   0   8   9
```
◆ = [ ]

b
```
        6   2   9
  +     ♥   1   ♥
  _____
    1   1   4   4
```
♥ = [ ]

c
```
        ★   8   ★
  -     3   ★   2
  _____
    1   ★   2
```
★ = [ ]

d
```
        ☺   4   1
  -     2   3   ☺
  _____
    3   0   6
```
☺ = [ ]

Written methods – two-step word problems

When you are tackling a word problem in maths you need to read it carefully and ask yourself two key questions:

1 What are the important numbers?

2 What key words help me to understand which operations I need to use?

Sometimes there may be more than one step to the problem. Here's an example:

Mr Jones is sorting out the PE cupboard. He knows he had 90 tennis balls at the beginning of term. Y4 have borrowed 35. There are now 52 in the cupboard. How many balls are missing?

1 Numbers?   90, 35, 52

2 Key words/operations?   'borrowed' and 'missing' suggest subtraction

      Step 1: 90 − 35 = 55 There should be 55 balls in the cupboard.

      Step 2: 55 − 52 = 3   So 3 balls are missing.

---

1   **Solve these two-step word problems:**

a   Jayden has been collecting football cards. He has 120 in his collection. He lends 42 cards to his friends, but is worried that he may have lost some. He counts his cards and finds he has 74. Has he lost any? If so, how many?

  1   Numbers?

  2   Key words/ operations?

      Step 1:

      Step 2:

      Answer:

Written methods – two-step word problems

b A Year 4 class earns 32 merit points in the first term of the year. In the second term they earn 47. If they have a total of 130 points by the end of the year, how many points did they earn in the third term?

1 Numbers?

2 Key words/ operations?

Step 1:

Step 2:

Answer:

....

c In the archery competition, our team, Riz and Dennis, scored 125 and 232. The winning team scored 480. How many less than the winning team did our team score?

1 Numbers?

2 Key words/ operations?

Step 1:

Step 2:

Answer:

Read carefully!

What are the important numbers?

What are the key words?

What operations do I need?

RECUERDA

Biggest total

Getting ready

This is a game for four players. Each player will need to copy and cut out the digit cards below. They will also need the addition frame on this page and a piece of scrap paper to write the answer on.

copy

0	1	2	3	4
5	6	7	8	9

What to do

Choose one person to be the caller.

This person calls out the single digits above, randomly one at a time.

The other players place the digits in a box in the frame below, in any order. Players must think carefully about which square to place the digit, in order to create the largest total.

When all the players have filled in the frame, they complete the addition.

The biggest answer scores a point. Play the best out of 5.

E **3**

SERIES   TOPIC

Addition and Subtraction

Claim the difference

Getting ready

This is a game for two players. Each player will need to copy and cut out the digit cards. To play you need to share the number grid on this page. Each player should have a piece of scrap paper to write the answer on and three counters in the same colour, but different to the other player.

C copy

What to do

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

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

Digit cards
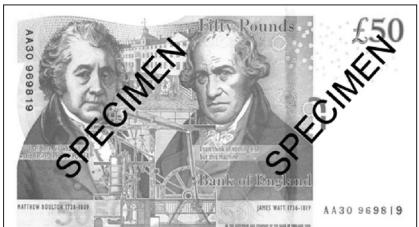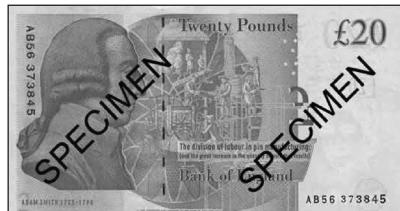
0	1
2	3
4	5

14	42	22	12
31	13	5	9
18	31	29	11
27	28	6	17

Addition and Subtraction

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E SERIES **3** TOPIC | 39
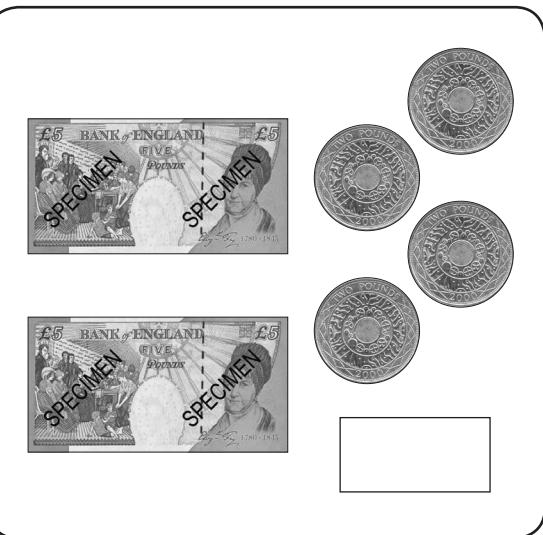
Money – coin combinations

It is important that you are able to recognise these notes and coins so that you are able to spend and save your money wisely.
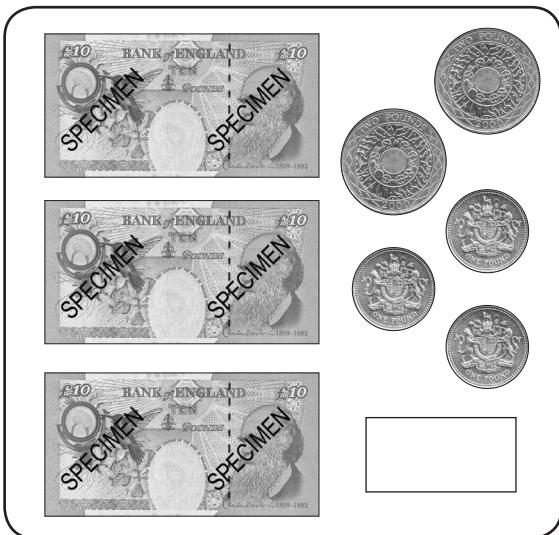
1 Calculate the total of each group of cash:

a

b

c

d

Addition and Subtraction

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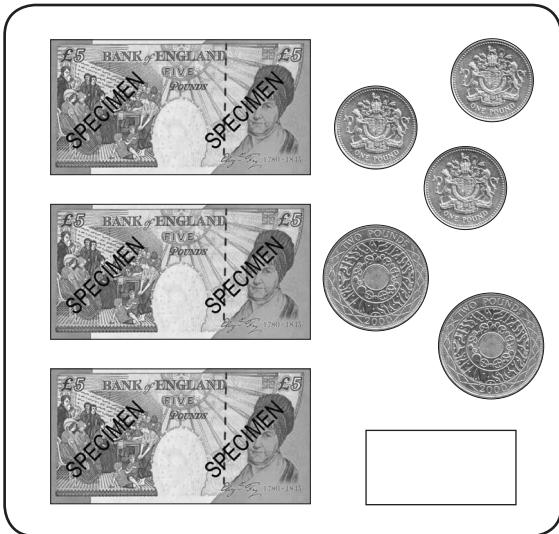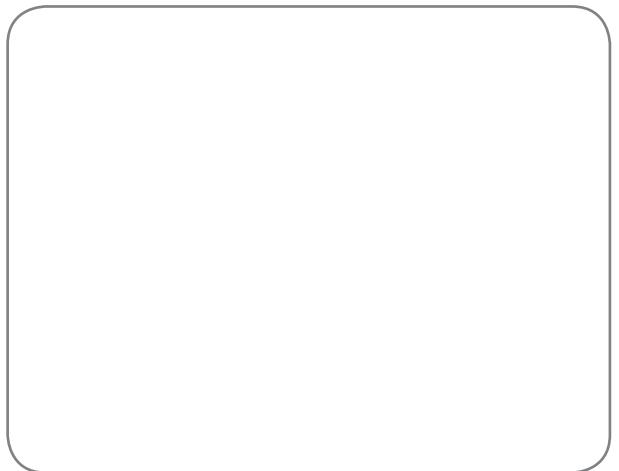
Money – coin combinations

2 **Make up each amount below using notes and coins in two different ways:**
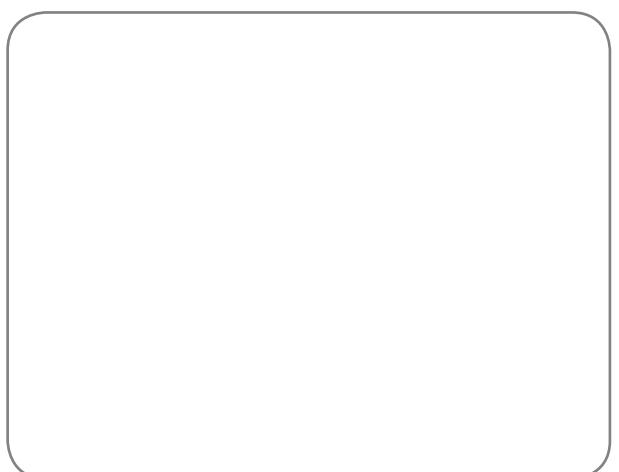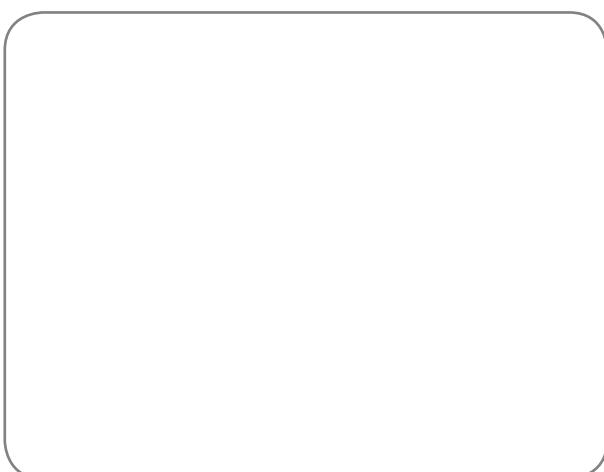
a Show £20:

b Show £50:

c Show £100:

Money – finding change

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

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

£12

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

a I had £100. I spent £68.

Change =

b I had £50. I spent £22.

Change =

c I had £20. I spent £16.50.

Change =

d I had £120. I spent £60.

Change =

e I had £100. I spent £75.

Change =

f I had £50. I spent £42.

Change =

Addition and Subtraction

Money – using money

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

1 **Here is a price list of party items:**

Food	
Sausage rolls	£3.20
Pizza slices	£8.95
Burgers	£7.65

Drink	
Orange juice	£2.75
Lemonade	£3.10
Cola	£3.25

Party favours	
10 party hats	£3.80
10 balloons	£1.90
4 game prizes	£5.60

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

Change = ☐

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

Heidi's shopping list:

2 packs of sausage rolls .. _____

4 packs of pizza slices ..... _____

10 party hats .... _____

20 balloons .... _____

Orange juice .... _____

Lemonade...................... _____

c Look at the price lists for the party items at the top of this page. Add up the total amount on Heidi's shopping list.

Total _____

d Heidi's budget is £50. Suggest something to take off the total.

Calculate the change   apply

What to do

The aim of the game is to end up with the most amount of money at the end of each round.

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

Die number	Amount you have	Amount you spend
⚀	£20	It's your friend's birthday, you spend £5.25 on a card.
⚁	£15	You spend £7.50 on school supplies.
⚂	£5	You buy some lollies for £3.85.
⚃	£5	You spend £4.25 downloading songs from the internet.
⚄	£10	A trip to the movies costs £7.80.
⚅	£20	You are fined £17.80 for littering.

Addition and Subtraction

C copy

Round 1	
Number rolled	**Change**
Total	
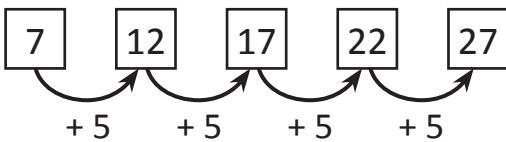
Round 2	
Number rolled	**Change**
Total	

Round 3	
Number rolled	**Change**
Total	

Patterns and algebra – completing and describing patterns

So far we have looked at skip counting patterns that begin at zero.
Here is a skip counting pattern of 5s that begins at 7.

This pattern starts at 7.

| 7 | 12 | 17 | 22 | 27 |

+ 5   + 5   + 5   + 5

The rule is: add 5.

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

a Add 10 | 11 | | | | | | | |

b Add 5 | 55 | | | | | | | |

c Subtract 4 | 40 | | | | | | | |

2 **Practise counting backwards by 10 and 100.**

Backwards by 10:

a 112

b 219

c 583

Backwards by 100:

a 673

b 798

c 1,010

3 **Complete the number patterns and identify the rule.**

a | 34 | 134 | | | 434 |

b | 127 | | 107 | 97 | |

c | | | 508 | 408 | 308 |

d | 127 | | 147 | 157 | |

46

Addition and Subtraction

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Patterns and algebra – completing and describing patterns

4 Look at the number grids below. Complete the missing boxes following the pattern.

a

15			
	26	27	
			38
		47	

b

32			41
	41	44	
	47		53
50		56	

c

	34		
35	39		

d

			45
25	34		
39			

....

5 Identify the missing numbers in each pattern and write the rule.

a   72   63   ☐   45   36   ☐   **b**   81   73   65   ☐ ☐ ☐

Rule: _____   Rule: _____
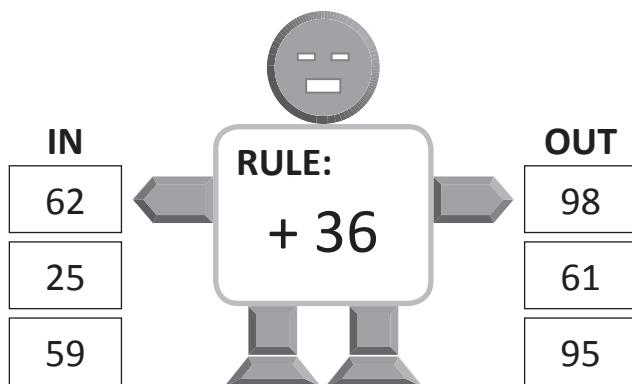
c   ☐   49   54   ☐   64   ☐   **d**   28   35   ☐   49   56   ☐

Rule: _____   Rule: _____
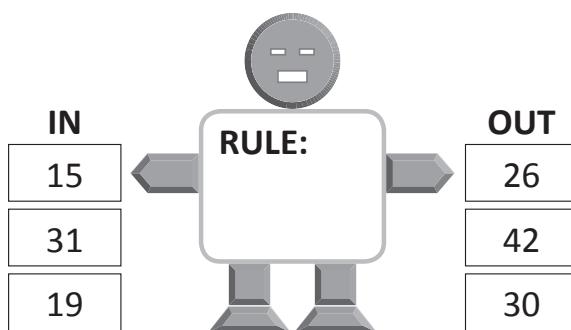
Patterns and algebra – function machines

This is a function machine.

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

IN	RULE: + 36	OUT
62		98
25		61
59		95
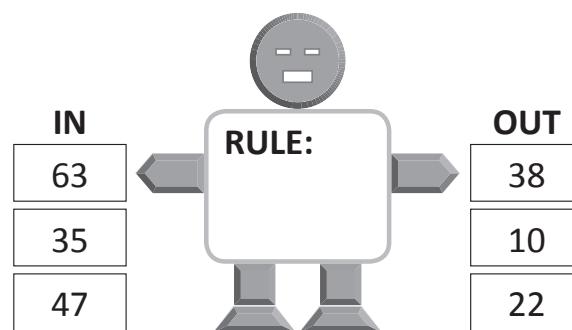
1 Look carefully at the numbers going *in* these function machines and the numbers coming out. What is the rule?

a

IN	RULE:	OUT
15		26
31		42
19		30

b

IN	RULE:	OUT
63		38
35		10
47		22
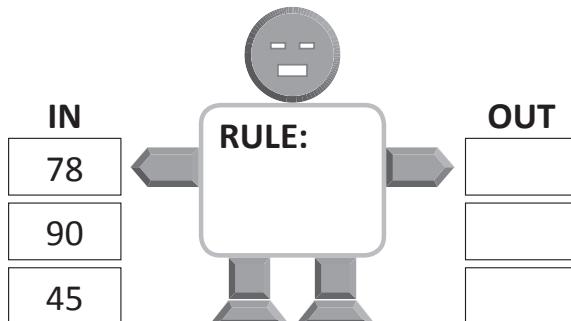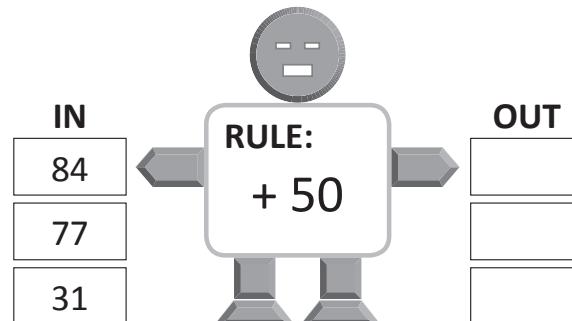
2 What numbers will come *out* of these function machines?

a

IN	RULE:	OUT
78		
90		
45		

b

IN	RULE: + 50	OUT
84		
77		
31		
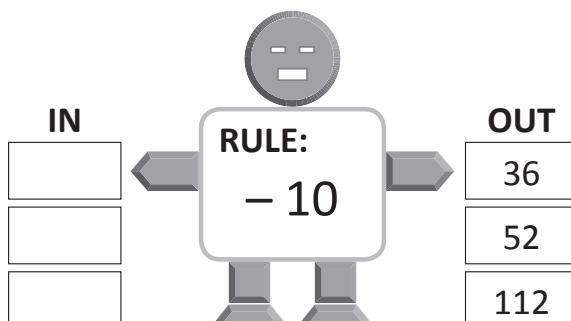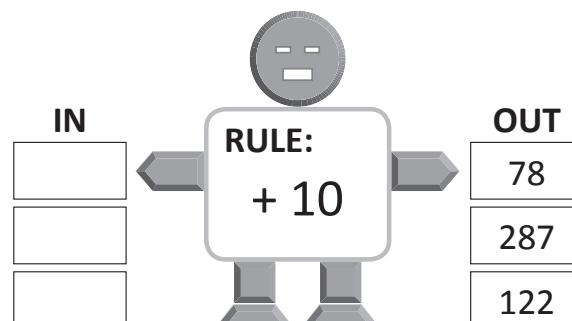
3 What numbers go *in* to these number function machines?

a

IN	RULE: − 10	OUT
		36
		52
		112

b

IN	RULE: + 10	OUT
		78
		287
		122
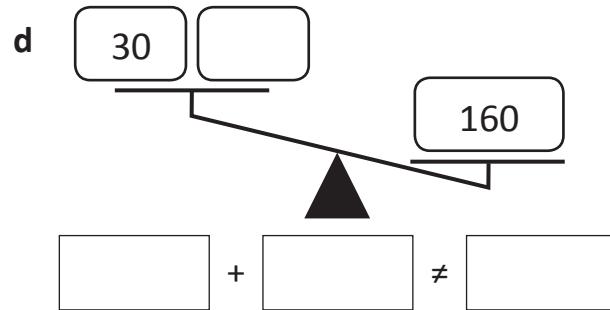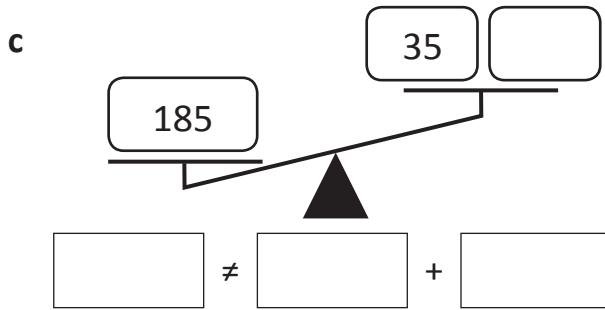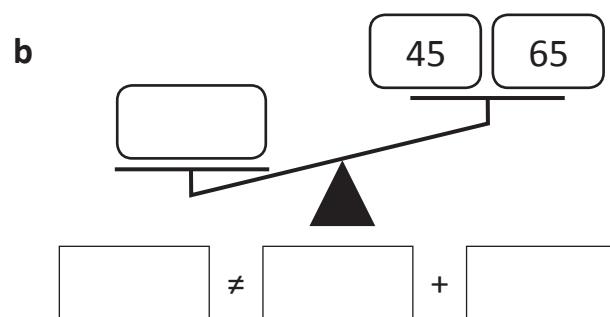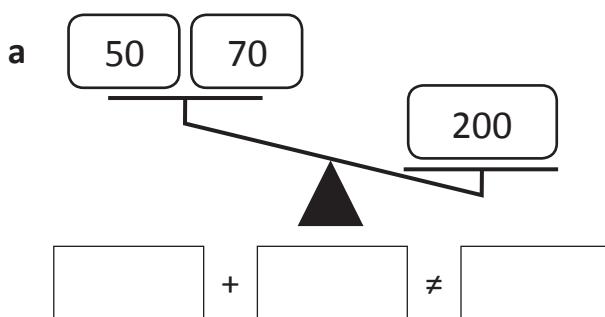
Patterns and algebra – not equal to symbol
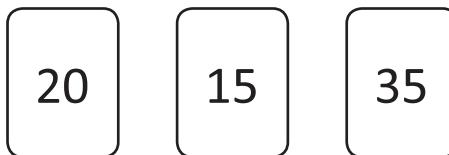
When two sides of an equation are not balanced, it means that they are not equal. To show that an equation is not equal, we use the <u>not equals</u> symbol like this:

$$\boxed{12} + \boxed{9} \ne \boxed{20}$$

1 Write numbers in each box to show equations that are not balanced:

a $\boxed{50}\ \boxed{70}$ $\boxed{200}$

$\boxed{} + \boxed{} \ne \boxed{}$

b $\boxed{45}\ \boxed{65}$ $\boxed{}$

$\boxed{} \ne \boxed{} + \boxed{}$

c $\boxed{35}\ \boxed{}$ $\boxed{185}$

$\boxed{} \ne \boxed{} + \boxed{}$

d $\boxed{30}\ \boxed{}$ $\boxed{160}$

$\boxed{} + \boxed{} \ne \boxed{}$

2 Complete the equations below by using only the numbers in the cards.
Look carefully to see whether it is an = or ≠ symbol.

$$\boxed{20} \quad \boxed{15} \quad \boxed{35}$$

a $\boxed{} + \boxed{} = \boxed{50}$

b $\boxed{} + \boxed{} \ne \boxed{50}$

c $\boxed{} + \boxed{} = \boxed{35}$

d $\boxed{} + \boxed{} \ne \boxed{35}$

Patterns and algebra – understanding equivalence

Look at these balanced scales.
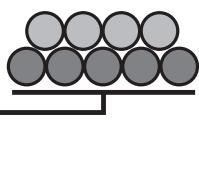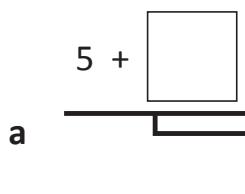
On one side there is the sum 4 + 3 and on the other side there is a total of 7 triangles. This makes sense because it shows the equation 4 + 3 = 7.
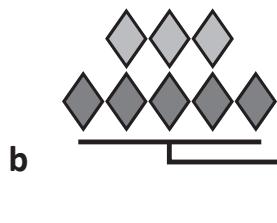
Equation is another word for a sum. With equations, both sides must be equal.

$$4 + 3$$

$$4 + 3 = 7$$

1 Balance each set of scales by writing a number in the box that is equivalent to the total number of shapes. Then write the matching equation.

a 5 + ☐

☐ + ☐ = ☐
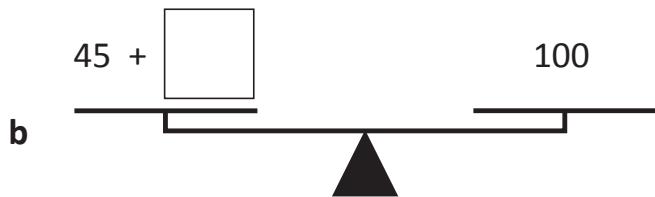
b 5 + ☐

☐ + ☐ = ☐

....

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

a ☐ + 55   85

☐ + ☐ = ☐

b 45 + ☐   100

☐ + ☐ = ☐

E SERIES   5 TOPIC

Addition and Subtraction
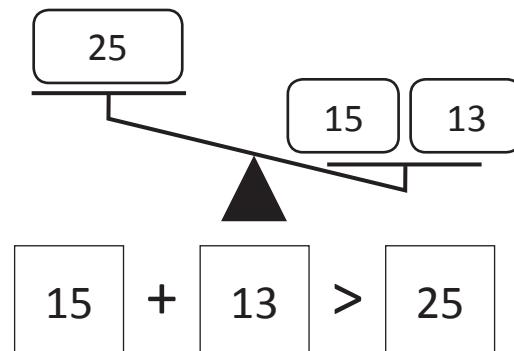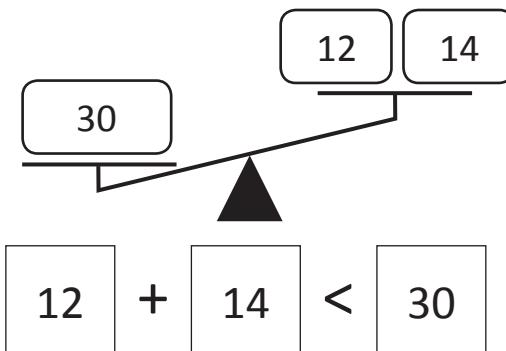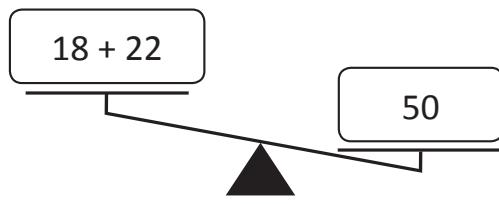
Patterns and algebra – greater than and less than

When two sides of an equation are not balanced, one side is greater than the other. We can show this with greater than (>) and less than (<) symbols like this:

| 12 | + | 14 | < | 30 |

| 15 | + | 13 | > | 25 |
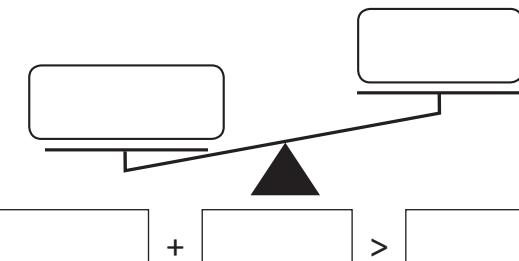
1 Complete the equations below by using only the numbers in the cards. Look carefully to see whether it is an **>** or **<** symbol. The first one has been done for you.

a

18 22 50

18 + 22

50
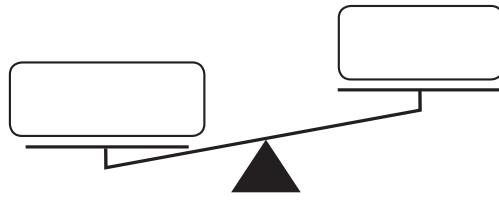
| 18 | + | 22 | < | 50 |

b

35 25 50

| | + | | > | |
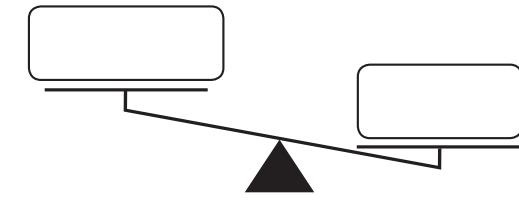
c

78 32 100

| | + | | > | |

d

107 83 200

| | + | | < | |

2 Alex is older than Gilly but younger than Taylor. Their ages could be described as:

16 > 12 > 9

How old is each person?   Alex is _____   Gilly is _____   Taylor is _____

Patterns and algebra – greater than and less than

3 **Complete the number sentences below by writing numbers in the blank boxes:**

a [38] + [ ] > [100]   b [29] + [ ] < [100]

c [ ] > [243] + [257]   d [500] < [460] + [ ]

e [ ] + [ ] > [1,000]   f [ ] + [ ] < [1,000]

g [ ] + [ ] > [ ]   h [ ] + [ ] < [ ]

....

4 **Sam and Will's mother is trying to work out how much to budget for her children's daily lunch orders. She is wondering if £50 is enough for both Sam and Will. Add up the cost of each child's lunch order for the week and then complete a matching number sentence.**

> When you add these amounts, look for bonds to £1. For example:
>
> £1.40 + £1.60 = (40p + 60p) + £1 + £1 = £3

THINK

Sam's lunch orders	Monday	Tuesday	Wednesday	Thursday	Friday
	£4.60	£5.40	£7.30	£3.70	£6

Will's lunch orders	Monday	Tuesday	Wednesday	Thursday	Friday
	£5.20	£3.80	£5.90	£6.10	£5

[ ] + [ ] ◯ [£50]

Sam's total   Will's total
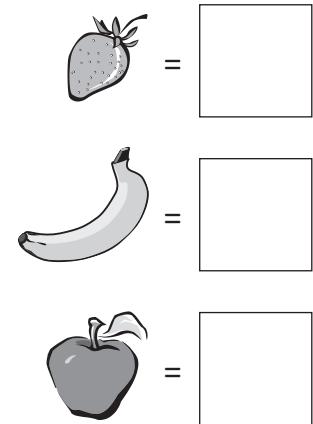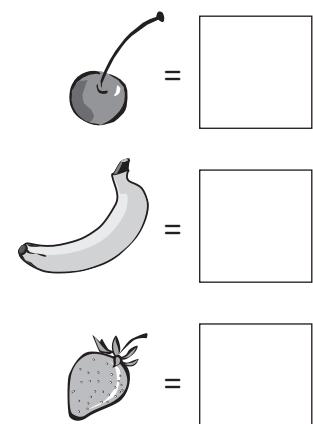
Fruit values

What to do → Work out the value of each type of fruit:
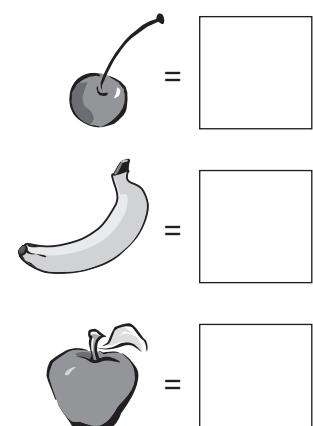
🍓	🍌	🍓	37
🍌	🍌	🍌	45
🍎	🍎	🍌	33
35	39	41	

🍓 = [ ]

🍌 = [ ]

🍎 = [ ]

🍌	🍌	🍒	14
🍓	🍓	🍓	33
🍌	🍒	🍒	22
15	23	31	

🍒 = [ ]

🍌 = [ ]

🍓 = [ ]

|			
🍒	🍎	🍎	18
🍒	🍌	🍌	38
🍒	🍎	🍒	33
48	13	28	

🍒 = [ ]

🍌 = [ ]

🍎 = [ ]
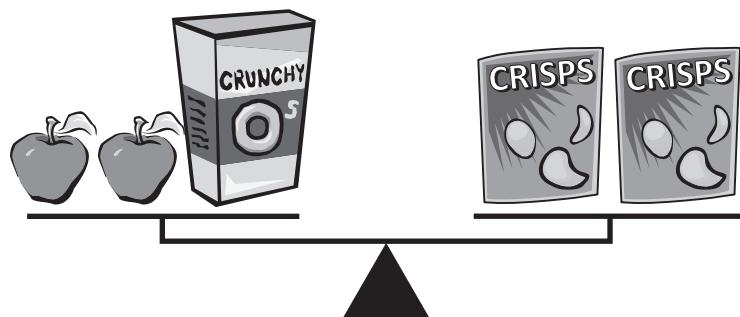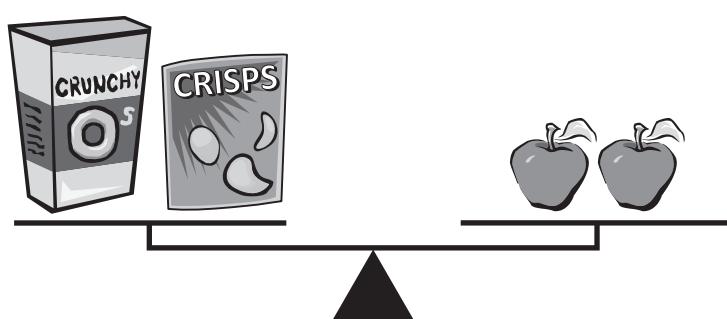
What to do → Work out what is the snack box from the clues.

Clue 1

Clue 2

Hint: **Keep the scale balanced by adding Crunchy Os to each side in Clue 2. Then work out what else 2 packets of crisps is equal to. From there, you can work out your answer.**

DISCOVER

Addition and Subtraction