Mathletics

Addition and Subtraction

My name

Series F – Addition and Subtraction

Contents

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Addition mental strategies – jump strategy

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

1 First we jump in tens.

2 Then we jump in the ones number.

```
        + 10        + 10        + 10      + 2
      ⌒          ⌒          ⌒        ⌒ ⌒
◄─────────────────────────────────────────────────────►
   257          267          277        287  288  289
```

257 + 32 = 289
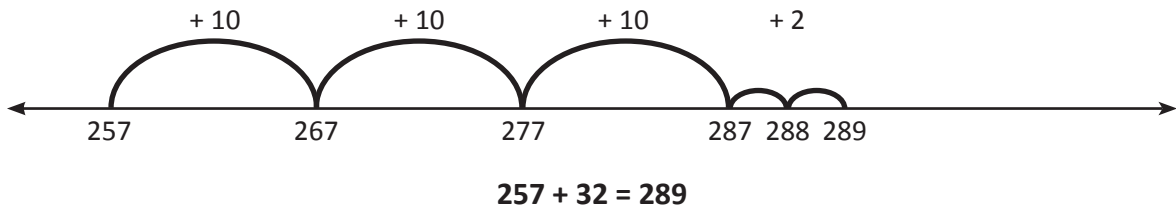
1 **Warm up with jumping in tens up and down these ladders:**

	224	335		
		325		
				412
259				
249	184		75	

2 **Use the jump strategy to complete these additions:**

a   575 + 52 = ☐

```
          + 10       + 10       + 10       + 10       + 10     + 2
        ⌒         ⌒         ⌒         ⌒         ⌒       ⌒ ⌒
◄──────────────────────────────────────────────────────────────────►
   [575]      [585]      [   ]      [   ]      [   ]      [  ][  ]
```

b   759 + 41 = ☐

```
◄──────────────────────────────────────────────────────────►
     759
```

c   135 + 73 = ☐

```
◄──────────────────────────────────────────────────────────►
     135
```
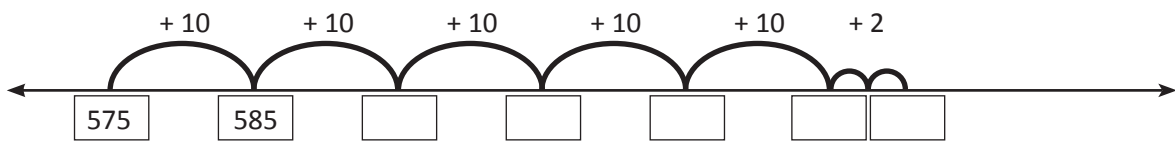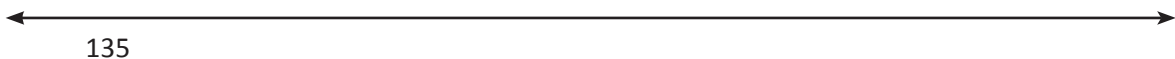
Addition mental strategies – jump strategy

3   A group of friends each bought a bag of mixed sweets at a sweet shop. Practise using the jump strategy to solve each problem. Write your answer and any working out in the space below each problem:
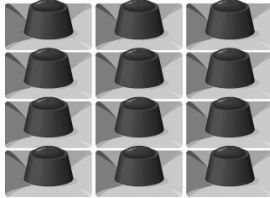
Choc mints	Jellybeans	Cream chocs	Chocolate bonbons
90p per scoop	55p per scoop	95p per scoop	75p per scoop

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

<———>

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

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

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

> **Remember with addition, you can start with either number.**

REMEMBER

....

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

a
```
┌─────────────┐
│             │
├──────┬──────┤
│  51  │  35  │
├────┬─┴──┬───┤
│ 41 │ 10 │ 25│
└────┴────┴───┘
```

b
```
┌─────────────┐
│             │
├──────┬──────┤
│      │  60  │
├────┬─┴──┬───┤
│ 32 │ 40 │ 20│
└────┴────┴───┘
```

c
```
┌─────────────┐
│             │
├──────┬──────┤
│      │      │
├────┬─┴──┬───┤
│ 15 │ 60 │ 13│
└────┴────┴───┘
```

F **1**
SERIES   TOPIC

Addition and Subtraction
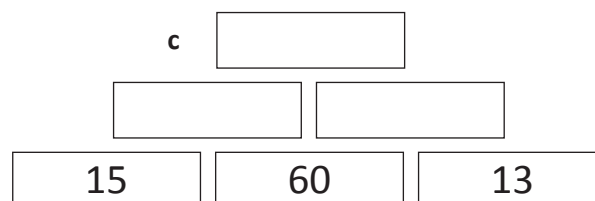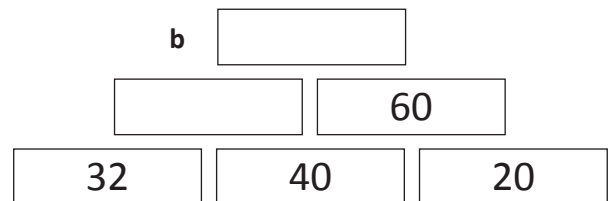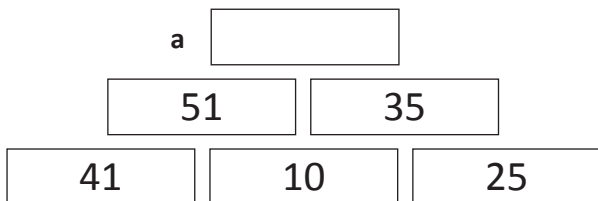
Addition mental strategies – split strategy

> 138 can be split into 100, 30 and 8.

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

$$214 + 138 \begin{cases} 100 \\ 30 \\ 8 \end{cases} \rightarrow 214 + 100 = 314 \rightarrow 314 + 30 = 344 \rightarrow 344 + 8 = 352$$

214 + 138 = 352

REMEMBER

---

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

a   623 + 28 $\begin{cases} 20 \\ 8 \end{cases}$

$623 + 20 = 643$

$643 + 8 = 651$

$623 + 28 = 651$

b   38 + 26 $\begin{cases} \ \\ \ \end{cases}$

_____

_____

38 + 26 = ☐

c   156 + 142 $\begin{cases} \ \\ \ \\ \ \end{cases}$

_____

_____

_____

156 + 142 = ☐

....

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

a   416 + 90 + 1 = 507

was

416 + _____91_____

b   230 + 30 + 3 = ☐

was

230 + _____

c   283 + 60 + 7 = ☐

was

283 + _____

d   532 + 60 + 1 = ☐

was

532 + _____

e   425 + 100 + 40 + 2 = ☐

was

425 + _____

f   129 + 200 + 40 + 6 = ☐

was

129 + _____

....

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

a   173 + 36 = ☐

b   446 + 51 = ☐

c   112 + 83 = ☐

d   724 + 72 = ☐

e   475 + 122 = ☐

f   123 + 164 = ☐

Addition mental strategies – split strategy

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

not to scale
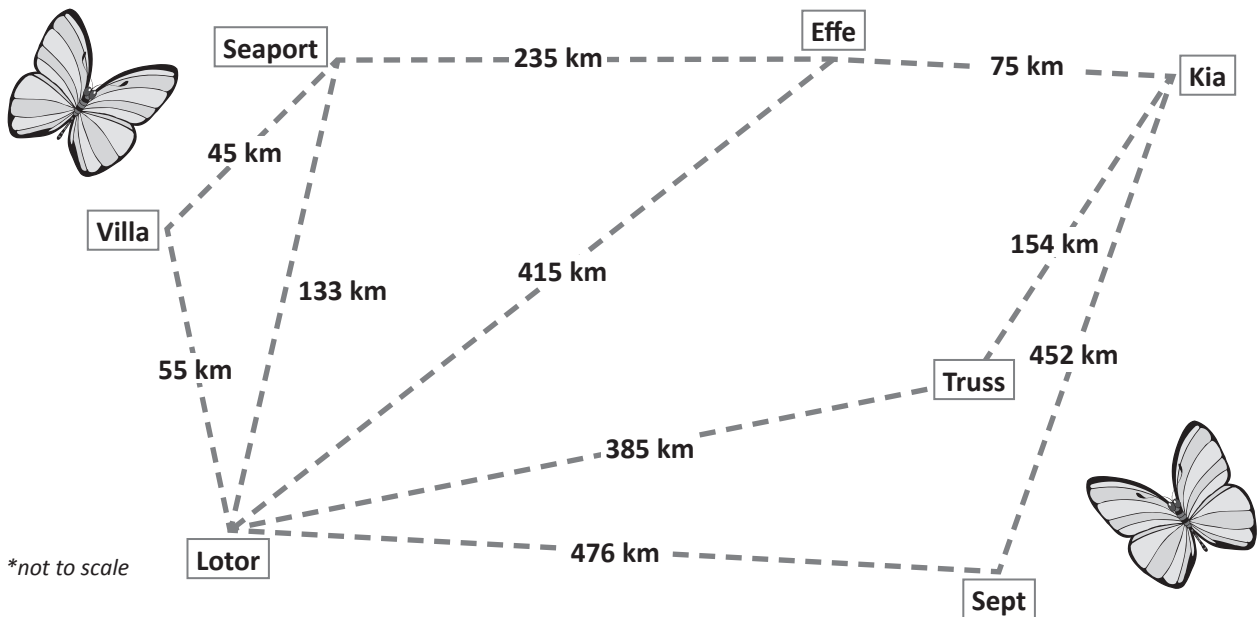
Flight path	Distances to add	Total distance
The Field Crescent flies from Lotor to Villa and then to Seaport	55 + 45	
The Painted Lady flies from Sept to Lotor and then to Villa		
The Fawn flies from Seaport to Effe and then to Kia		
The Monarch flies from Sept to Kia and then to Effe		

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

£28.50 + £16.80 = (£28 + £16) + (£0.50 + £0.80)

= £44 + £1.30

= £45.30

5 **Match the price tags with the bills:**

£18.25 + £12.75

Total: £31

£64.70 + £11.30

Total: £46

Total: £76

£11.85 + £34.15

Total: £130

£56.35 + £73.65

F **1**

SERIES   TOPIC

Addition and Subtraction

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Addition mental strategies – compensation strategy

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

405 + 69   = ☐ 474

405 + 70 ⊖ −1   *I rounded up by 1*

475 ⊖ −1   = 474   *so I subtract 1.*

> I added 1 extra to round to 70 so I have to take 1 off my answer.

THINK

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

a 48 _____   **b** 67 _____   **c** 232 _____   **d** 74 _____

e 89 _____   **f** 456 _____   **g** 955 _____   **h** 786 _____

2   **Solve these problems using compensation:**

a 45 + 37   = ☐

45 + 40 ◯

_____ ◯ = _____

b 66 + 18   = ☐

66 + _____ ◯

_____ ◯ = _____

c 86 + 49   = ☐

86 + _____ ◯

_____ ◯ = _____

d 124 + 57   = ☐

124 + _____ ◯

_____ ◯ = _____

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

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

a 26 + 42   = ☐

26 + 40 ◯

_____ ◯ = _____

b 35 + 63   = ☐

35 + _____ ◯

_____ ◯ = _____

c 96 + 21   = ☐

96 + _____ ◯

_____ ◯ = _____

d 145 + 34   = ☐

145 + _____ ◯

_____ ◯ = _____

Addition mental strategies – compensation strategy

4 **Connect the statements with their answer:**

When we round down we compensate by

When we round up we compensate by

subtracting

adding

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

a 425 + 67

b 673 + 98

c 275 + 91

d 784 + 32

e 316 + 73

f 115 + 79

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

Monday	Tuesday	Wednesday	Thursday	Friday
124	199	213	158	236

1900?

2000?

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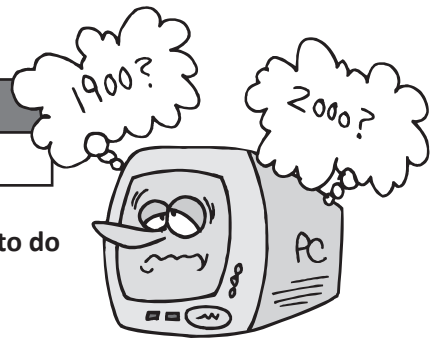
Use the compensation method to answer the following questions. Try to do the sum in your head, then show how you did it in the space below:

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

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

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

Addition and Subtraction

Getting ready

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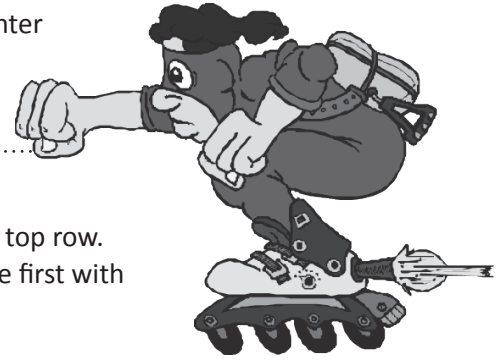
What to do

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

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

Add the two numbers using a strategy of your choice. Record your total as you go. Who will arrive at the finish with the largest score? Good luck!

Choose the best addition mental strategy.

THINK

81	76	93	42	89	50	66	74
62	28	54	37	63	45	95	39
87	70	69	83	75	57	12	49
63	93	52	44	86	67	37	58
38	47	83	17	95	72	49	56
90	73	68	39	54	23	85	43
41	36	51	91	78	66	17	32
63	81	27	11	44	46	50	74
FINISH							

Can you find the route that would give you the largest possible score?

DISCOVER

Work out the answers to these sums in your head. Each answer matches a letter in the list on the right. Write the letters next to your answers, then unjumble the letters to find the name of a city.

What to do

Try competing with a friend to be the fastest to do all of the sums and work out the names of the three cities.

a 701 + 126 = ⬜ Letter _____

501 + 81 = ⬜ Letter _____

810 + 117 = ⬜ Letter _____

304 + 205 = ⬜ Letter _____

810 + 17 = ⬜ Letter _____

230 + 626 = ⬜ Letter _____

The city is _____

b 293 + 216 = ⬜ Letter _____

811 + 111 = ⬜ Letter _____

650 + 130 = ⬜ Letter _____

610 + 57 = ⬜ Letter _____

380 + 32 = ⬜ Letter _____

The city is _____

c 816 + 40 = ⬜ Letter _____

913 + 62 = ⬜ Letter _____

751 + 105 = ⬜ Letter _____

830 + 79 = ⬜ Letter _____

882 + 93 = ⬜ Letter _____

471 + 111 = ⬜ Letter _____

The city is _____

Code
A = 922
B = 754
C = 141
D = 582
E = 927
F = 735
G = 222
H = 358
I = 780
J = 989
K = 481
L = 909
M = 398
N = 856
O = 975
P = 667
Q = 555
R = 412
S = 509
T = 538
U = 656
V = 1,110
W = 1,150
X = 716
Y = 827
Z = 1,907

F SERIES **1** TOPIC

Addition and Subtraction

Subtraction mental strategies – jump strategy

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

1 First we jump back in tens.

2 Then we jump back in the ones number.

Start

$$-10 \qquad -10 \qquad -10$$

$$-5$$

154   159   169   179   189

189 − 35 = 154

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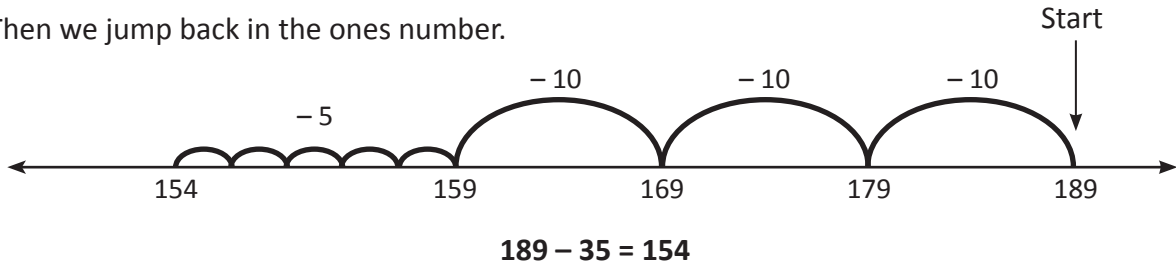
1 **Warm up with these subtraction wheels:**

Wheel 1 (center: 175 −): 20, 60, 5, 50, 75, 10, 70, 100, 40, 25, 80

Wheel 2 (center: 210 −): 10, 70, 5, 40, 75, 20, 60, 100, 50, 30, 80

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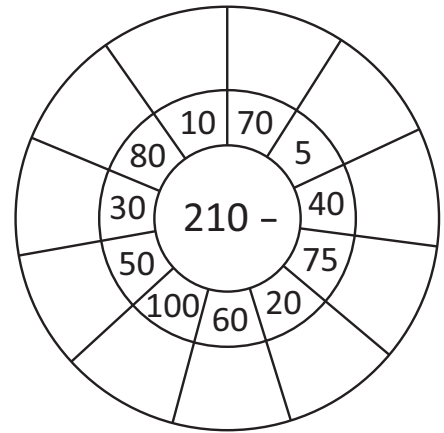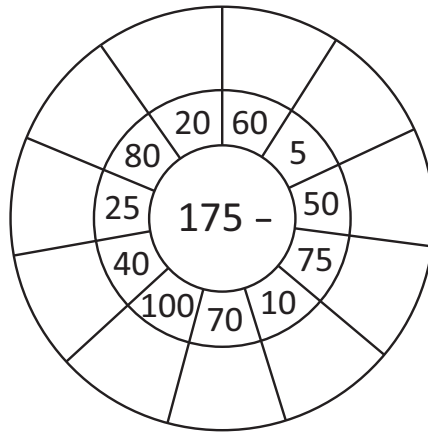
2 **Use the jump strategy to complete these subtraction problems. The first one has been started for you:**

a 586 − 55 = ☐

Start

$$-5 \qquad\quad -10 \qquad -10 \qquad -10 \qquad -10 \qquad -10$$

☐ ☐ ☐ ☐ ☐ ☐   586

b 388 − 45 = ☐

Start

388

c 624 − 31 = ☐

Start

624

d 155 − 95 = ☐

Start

155
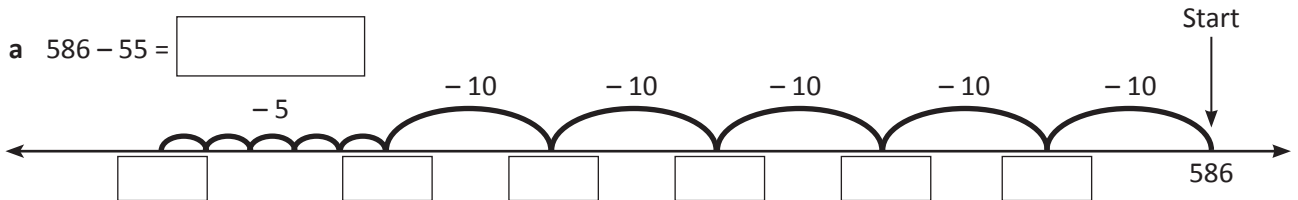
Subtraction mental strategies – jump strategy

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

a 274 – 30 = [   ]   **b** 872 – 61 = [   ]   **c** 444 – 50 = [   ]

d 784 – 61 = [   ]   **e** 189 – 35 = [   ]   **f** 825 – 60 = [   ]

....

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

Bionic Bozo	Revenge of the Ponies	Fitness Frenzy	Taekwondo Team
Was £105	**Was** £135	**Was** £102	**Was** £155
Now £75	**Now** £60	**Now** £91	**Now** £111
Save	Save	Save	Save

....

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

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

b Martin saved up especially for the sale and bought 2 items for £186. He bought Bionic Bozo and which other game?

c Dana bought Taekwondo Team for her husband before the sale. What change did she receive if she paid with £200?

F SERIES   2 TOPIC
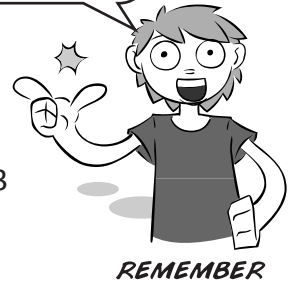
Addition and Subtraction

Subtraction mental strategies – split strategy

> Remember that 215 is 200 + 10 + 5

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.

$468 - 215$ { 200 / 10 / 5 } → $468 - 200 = 268$ → $268 - 10 = 258$ → $258 - 5 = 253$

$468 - 215 = 253$

REMEMBER

---

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

a 356 = 300 + 50 + 6

b 289 = _____

c 867 = _____

d 923 = _____

e 442 = _____

f 294 = _____

....

2 Use the split strategy to subtract:

a $468 - 316$

468 – 300 = _____

_____ – 10 = _____

_____ – 6 = _____

468 – 316 = _____

b $574 - 155$

_____ – _____ = _____

_____ – _____ = _____

_____ – _____ = _____

574 – 155 = _____

c $457 - 323$

_____ – _____ = _____

_____ – _____ = _____

_____ – _____ = _____

457 – 323 = _____

....

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

a 484 – 74 = [   ]

b 400 – 80 = [   ]

c 406 – 106 = [   ]

d 410 – 40 = [   ]

e 403 – 13 = [   ]

f 455 – 60 = [   ]

g 497 – 92 = [   ]

h 505 – 25 = [   ]

i 520 – 25 = [   ]

j 795 – 150 = [   ]

k 410 – 100 = [   ]

S	Y	H	O	U	E	R	X	E	L	A
300	195	410	305	150	320	505	370	595	405	200

K	Z	R	I	D	R	J	U	M	V	A
390	495	220	395	210	385	480	500	205	645	310

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

[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]

Subtraction mental strategies – split strategy

4 These problems have been completed. Are they correct? If not, circle where it all began to go wrong:
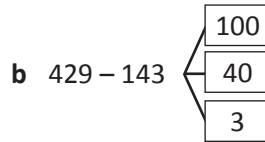
a $375 - 164$ ⇐ 100 / 60 / 4
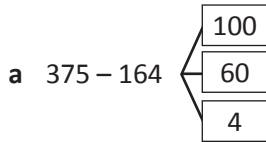
375 – 100 = 275
275 – 60 = 215
215 – 4   = 211
375 – 164 = 211

b $429 - 143$ ⇐ 100 / 40 / 3

429 – 100 = 323
323 – 4   = 319
319 – 3   = 316
429 – 143 = 316

c $179 - 158$ ⇐ 100 / 50 / 8
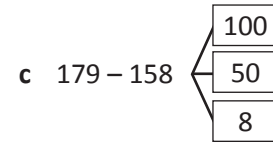
179 – 100 = 79
79 – 50   = 39
39 – 8   = 31
179 – 158 = 31

....

5 The following problems require you to add and subtract. Use the split strategy to help you solve them:

Four different families went on a holiday over Easter. Work out the distance that each car has travelled on the missing days:

	Robertsons	Pankhursts	Cailes	Darnleys
Day 1	125 km	225 km		130 km
Day 2	375 km		525 km	
Day 3		110 km	125 km	270 km
Total distance	735 km	836 km	950 km	695 km

Make as many notes as you need to help you:

....

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

Family

Robertsons

Darnleys

Pankhursts

Cailes

Place

Damp 'n Crazy Water Park – 726 km

The Big Baboon – 825 km

Insect Museum – 425 km

The Giant Toothbrush – 500 km

Addition and Subtraction

Subtraction mental strategies – compensation strategy

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

486 − 59   = | 427 |

486 − 60 (+ 1)   *I rounded up by 1, which means I subtracted*

426 (+ 1)   = 427   *1 extra so we need to add 1 back.*

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

THINK

---

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

a   93 = __*90 + 3*__   **b**   48 = _____   **c**   52 = _____   **d**   76 =_____

e   57 = _____   **f**   37 = _____   **g**   27 = _____   **h**   68 =_____

---

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

a   585 − 78   = | | **b**   894 − 71   = | | **c**   163 − 149   = | |

585 − 80 (+ 2)   894 − 70 (− 1)   163 − 150 (+ 1)

_____ ( ) = _____   _____ ( ) = _____   _____ ( ) = _____

---

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

a   555 − 63   **b**   775 − 98   **c**   644 − 139

d   594 − 329   **e**   432 − 204

> You can solve these in your head or make notes as you go. Do whatever works for you.

REMEMBER

Subtraction mental strategies – compensation strategy

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

a 454 – [ ] = 427

454 – 30 = 424 + 3 = 427

b [ ] – [ ] = [ ]

568 – 310 = 258 + 2 = 260

c [ ] – [ ] = [ ]

994 – 80 = 914 + 2 = 916

d [ ] – [ ] = [ ]

678 – 450 = 228 – 2 = 226

e [ ] – [ ] = [ ]

684 – 60 = 624 + 1 = 625

f [ ] – [ ] = [ ]

348 – 130 = 218 + 2 = 220

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

17 is close to 20 so I will subtract 20 and add 3.

THINK
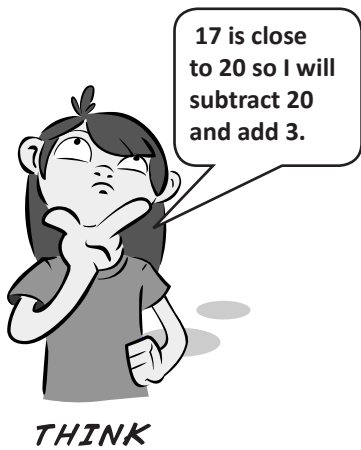
– 17	– 21	– 98	– 33
600	124	395	800
583	103	[ ]	[ ]
[ ]	[ ]	199	[ ]
549	[ ]	[ ]	[ ]

---

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

£4.50 – £2.75	£5.70 – £3.00 = £2.70	£2.45 + _____ =	
£10.00 – £6.25	£4.50 – £3.00 = £1.50	£4.25 + _____ =	
£5.70 – £3.05	£17.25 – £13.00 = £4.25	£1.50 + _____ =	
£17.25 – £12.90	£9.45 – £7.00 = £2.45	£4.00 – _____ =	
£9.45 – £6.85	£10.00 – £6.00 = £4.00	£2.70 – _____ =	*£1.75*

Snakes but no ladders   apply
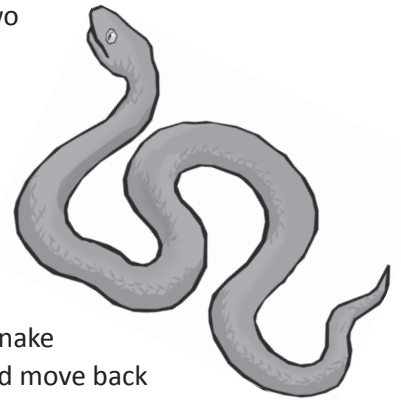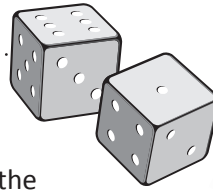
Getting ready

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

What to do

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

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

263 **Finish**	262 (−25)	261	260	259 (−32)	258	257	256
248	249 (−14)	250	251	252	253 (−50)	254	255 (−17)
247	246	245	244 (−9)	243	242	241	240
232 (−20)	233	234	235	236 (−3)	237	238 (−14)	239
231	230	229 (−21)	228	227	226 (−11)	225	224
216 (−8)	217	218	219 (−5)	220 (−17)	221	222	223
215	214	213 (−10)	212	211	210	209 (−6)	208
200 **Start**	201	202	203	204 (−3)	205	206	207

Getting ready

A game of darts is usually scored by subtracting the number that you throw from 301. Throwing darts can be dangerous in a classroom so you will be throwing dice instead!

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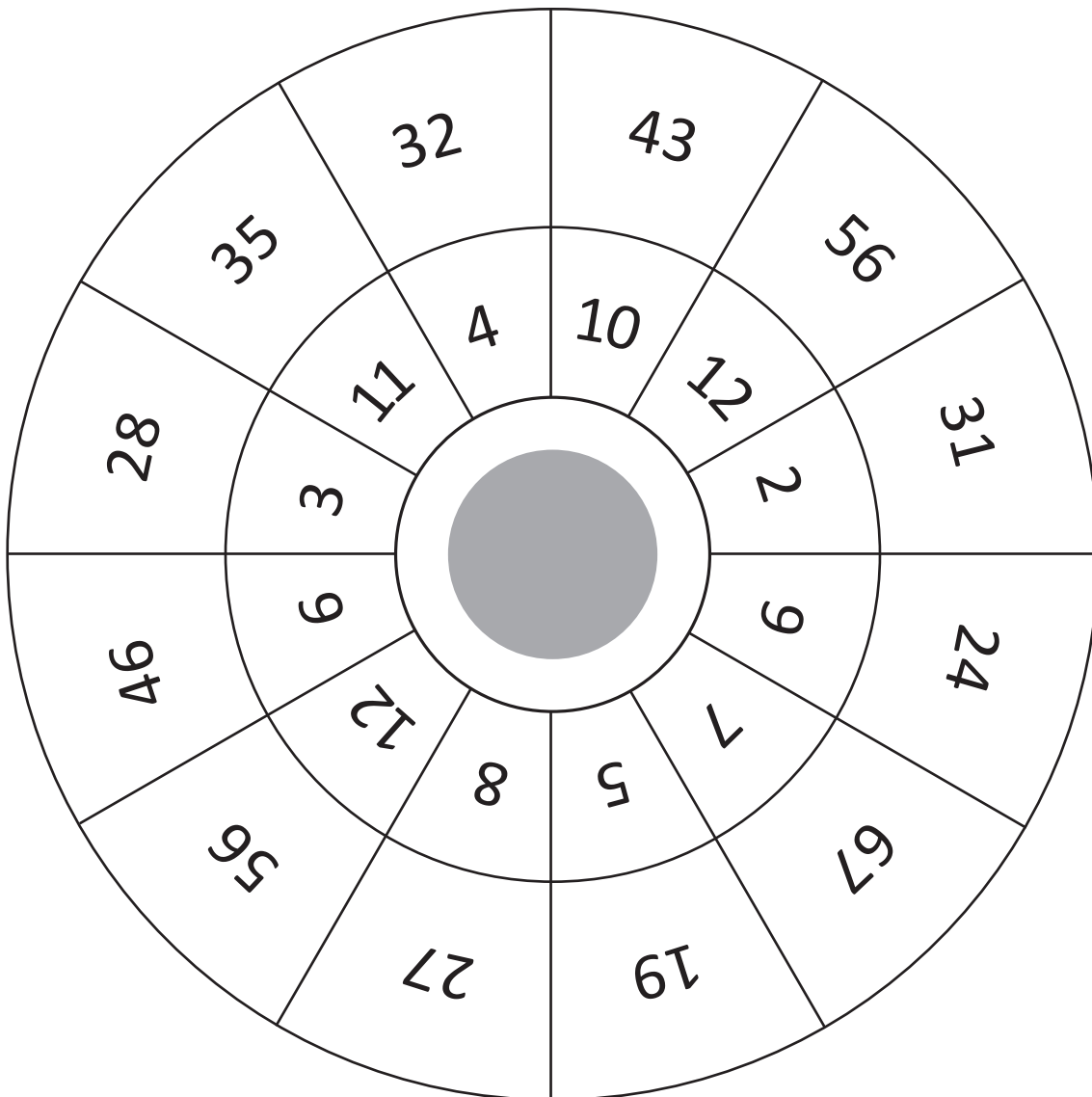
C copy

What to do

Throw two dice, find the total and look for the number in the inner ring. The number next to it in the outer ring is the one that you will subtract from. Start subtracting from 301, keeping score as you go.
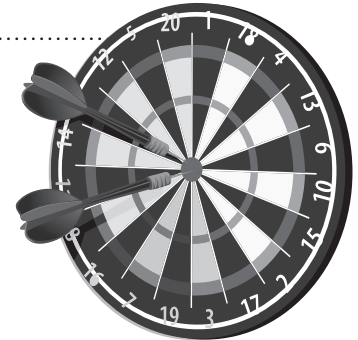
The winner is the first to get past 0!

Addition and Subtraction

Written methods – addition

How do we add using a written strategy?

First we estimate: 235 + 500 = 735. Our answer will be around 735.

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

We put the 4 in the ones column and carry the 1 to the tens column.

3 tens plus 8 tens plus the carried ten is 12 tens.

We rename this as 1 hundred and 2 tens

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

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

Finally we check against our estimate – do they match?

	H	T	O
	2	3	5
+	4	8	9
	7	2	4
		1	1

1 Solve these addition problems. First estimate the answers:

e:

a
	H	T	O
	5	4	1
+	3	1	3

e:

b
	H	T	O
	1	7	3
+	5	9	2

e:

c
	H	T	O
	3	8	4
+	2	1	3

e:

d
	H	T	O
	2	6	8
+	4	9	3

e:

e
	Th	H	T	O
	2	2	1	7
+	3	4	0	8

e:

f
	Th	H	T	O
	4	5	1	6
+	1	3	4	3

e:

g
	Th	H	T	O
	5	3	8	9
+	1	2	7	4

e:

h
	Th	H	T	O
	3	2	8	1
+	1	4	2	8

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

| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | | = | + |

Written methods – addition

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

> Guess, check and improve will help me here.

DISCOVER

a

H	T	O
	4		5
+		2	
	8	5	7

(columns: H T O — row 1: 4, ▧, 5; row 2: +, ▧, 2, ▧; sum: 8, 5, 7)

b

H	T	O
1	5	9
+ 2	4	▧
▧	0	6

(below: ⬚1 ⬚1)

c

H	T	O
5	6	7
+ ▧	▧	9
9	9	▧

(below: ⬚ ⬚1)

---

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

a e: _____

T Th	Th	H	T	O
	1	5	4	4	3
+	1	2	0	3	6
	⬚	⬚	⬚	⬚

b e: _____

T Th	Th	H	T	O
	3	8	1	9	1
+	1	0	2	8	7
	⬚	⬚	⬚	⬚

c e: _____

T Th	Th	H	T	O
	4	6	7	3	8
+	3	3	6	9	6
	⬚	⬚	⬚	⬚

d e: _____

T Th	Th	H	T	O
	2	5	8	7	4
+	5	4	7	9	9
	⬚	⬚	⬚	⬚

e e: _____

T Th	Th	H	T	O
	4	8	5	7	9
+	4	4	6	4	8
	⬚	⬚	⬚	⬚

f e: _____

T Th	Th	H	T	O
	7	8	4	2	8
+	5	0	5	6	5
	⬚	⬚	⬚	⬚

g e: _____

H Th	T Th	Th	H	T	O
	2	5	3	7	0	4
+	1	5	6	4	8	5
	⬚	⬚	⬚	⬚	⬚

h e: _____

H Th	T Th	Th	H	T	O
	5	0	8	9	4	1
+	2	6	4	5	3	7
	⬚	⬚	⬚	⬚	⬚

i e: _____

H Th	T Th	Th	H	T	O
	4	6	9	5	5	3
+	4	5	7	9	8	6
	⬚	⬚	⬚	⬚	⬚

j e: _____

H Th	T Th	Th	H	T	O
	1	8	8	4	3	8
+	6	5	4	4	5	7
	⬚	⬚	⬚	⬚	⬚

k e: _____

H Th	T Th	Th	H	T	O
	3	6	0	9	9	4
+	3	8	8	4	3	7
	⬚	⬚	⬚	⬚	⬚

l e: _____

H Th	T Th	Th	H	T	O
	6	5	7	7	2	7
+	8	4	6	9	7	8
	⬚	⬚	⬚	⬚	⬚

Written methods – subtraction

	H	T	O
	9	$^8\not{9}$	$^1 4$
–	2	7	8
	7	1	6

First we estimate: 1,000 – 300 = 700

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

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

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

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

We check the answer against our estimate.

1 Complete the subtraction problems:

e:

a

	Th	H	T	O
		4	9	8	2
–			1	5	3

e:

b

	Th	H	T	O
		2	9	5	1
–			8	7	8

e:

c

	Th	H	T	O
		3	8	7	2
–			5	8	6

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

Showtown   4,129 km   Tidings   1,233 km

Normanville 3,262 km   Ringer   7,869 km

Roper   7,419 km   Harpville 486 km

Ace Bay   1,226 km   Eagle Bay 595 km

2 Solve these problems to find the difference:

a How far from Showtown to Ringer?

Th	H	T	O

b What is the distance from Normanville to Tidings?

Th	H	T	O

c What is the distance from Roper to Eagle Bay?

Th	H	T	O

d How far from Normanville to Ace Bay?

Th	H	T	O

Written methods – subtraction

3 Solve these subtractions:

a

e: _____

	T Th	Th	H	T	O
	1	5	6	8	5
−		2	0	7	3

b

e: _____

	T Th	Th	H	T	O
	3	8	1	9	2
−	1	0	2	8	4

c

e: _____

	T Th	Th	H	T	O
	4	2	7	3	5
−	3	7	6	9	3

d

e: _____

	T Th	Th	H	T	O
	8	2	6	7	1
−	5	5	7	9	5

e

e: _____

	T Th	Th	H	T	O
	5	8	1	6	5
−	4	5	6	3	8

f

e: _____

	T Th	Th	H	T	O
	9	0	6	2	8
−	7	1	7	6	4

g

e: _____

	H Th	T Th	Th	H	T	O
	2	5	8	7	1	4
−		5	5	4	7	6

h

e: _____

	H Th	T Th	Th	H	T	O
	8	0	7	9	2	5
−		4	5	2	3	6

i

e: _____

	H Th	T Th	Th	H	T	O
	4	6	4	3	9	2
−	4	5	8	7	8	7

j

e: _____

	H Th	T Th	Th	H	T	O
	9	8	4	1	3	2
−	6	5	4	7	5	5

k

e: _____

	H Th	T Th	Th	H	T	O
	4	6	7	9	2	3
−	3	8	8	4	3	7

l

e: _____

	H Th	T Th	Th	H	T	O
	6	5	7	7	8	7
−	4	7	6	9	7	8

Always make sure that your answer and your estimate are close. If they are not, recheck your calculation!

CHECK

F SERIES
3 TOPIC

Addition and Subtraction
Copyright © 3P Learning
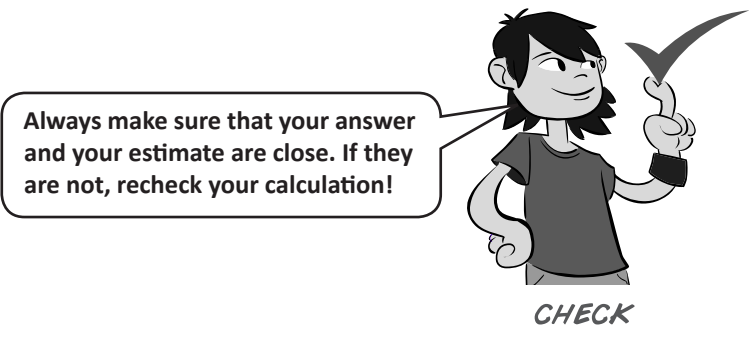
Written methods – subtraction

4 Add each group of numbers. Use the key below to identify the letters each digit represents. Write each word in the correct place in the crossword puzzle.
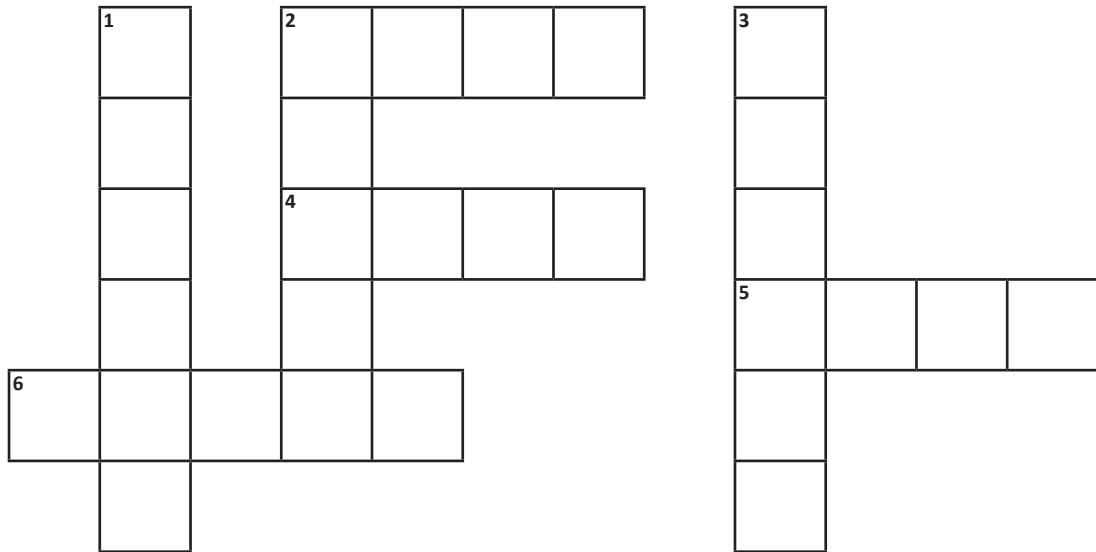
CLUES

Across

2. 2,575 + 1,589   = _____

4. 2,458 + 1,207   = _____

5. 4,504 + 2,861   = _____

6. 12,824 + 44,230 = _____

Down

1. 34,569 + 582,104 = _____

2. 20,786 + 22,589   = _____

3. 423,219 + 120,556 = _____

Key

0	1	3	4	5	6	7	8
O	I	E	H	S	G	L	B

....

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

	H	T	O
−			
		4	2

	H	T	O
−			
		4	2

	H	T	O
−			
		4	2

	H	T	O
−			
		4	2

	H	T	O
−			
		4	2

Written methods – adding and subtracting decimals

When we add and subtract decimals we follow the same rules we use when working with whole numbers. We need to make sure we line up each place value and decimal point:

	T	O	•	t
	³4̶	¹3	•	3
−	1	7	•	2
	2	6	•	1

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

e:

a
	T	O	•	t
	5	4	•	1
+	3	1	•	3

e:

b
	T	O	•	t
	3	2	•	3
+	5	8	•	1

e:

c
	T	O	•	t
	4	8	•	4
+	4	1	•	3

e:

d
	T	O	•	t
	2	7	•	8
+	3	9	•	3

e:

e
	T	O	•	t	h
	5	2	•	1	7
+	3	5	•	9	2

e:

f
	T	O	•	t	h
	4	5	•	1	
+	1	4	•	0	5

e:

g
	T	O	•	t	h
	5	3	•	8	9
+	1	2	•	1	4

e:

h
	T	O	•	t	h
	3	2	•	4	1
+	1	9	•	3	3

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

e:

a
	O	•	t	h
	8	•	4	3
−	3	•	2	3

e:

b
	O	•	t	h
	9	•	0	8
−	5	•	3	2

e:

c
	O	•	t	h
	7	•	6	3
−	2	•	0	4

e:

d
	O	•	t	h
	9	•	7	
−	3	•	2	3

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

Addition and Subtraction

Written methods – adding and subtracting decimals

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

Was   £9.99
Now £8.50

Save £_____

Was   £8.50
Now £7.99

Save £_____

Was   £7.35
Now £6.85

Save £_____

Was   £8.95
Now £6.50

Save £_____

Was   £2.89
Now £1.65

Save £_____

Was   £4.66
Now £3.89

Save £_____

Total savings: _____

Written methods – word problems

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

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

+ ------------------------

− ------------------------

Answer _____

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

+ ------------------------

− ------------------------

Answer _____

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

+ ------------------------

− ------------------------

Answer _____

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

+ ------------------------

− ------------------------

Answer _____

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

+ ------------------------

− ------------------------

Answer _____

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

+ ------------------------

− ------------------------

Answer _____

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

+ ------------------------

− ------------------------

Answer _____

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

+ ------------------------

− ------------------------

Answer _____

i Write your own word problem and solve it.

+ ------------------------

− ------------------------

Answer _____

F SERIES   3 TOPIC

Addition and Subtraction

Written methods – word problems

Some word problems have more than one step and may involve more than one type of operation. Look at this problem:

Tarik scored 10,357 points on level 1 of his new game. He then scored 9,321 points on level 2 but had a 3,000 point penalty for being slow. How many points did he have in total on the two levels?

Can you see which operations you need to do to solve this problem?

You need to **add** the points totals for the two levels, but then **subtract** the penalty points.

	T Th	Th	H	T	O
	1	0	3	5	7
+		9	3	2	1
	1	9	6	7	8

19,678 − 3,000 = 16,678

2 **Solve these 2-step word problems:**

a It is a 5,576-kilometre flight From London to New York. From New York to Los Angeles is 3,940 kilometres. If a plane has enough fuel to go 10,000 kilometres, could it get to Los Angeles from London without stopping? If so, how many kilometres-worth of fuel would it have left in its tanks when it lands?

b After the first day of the 2012 Olympic heptathlon Jessica Ennis was 184 points ahead of her nearest rival. She finished the competition on 6,955 points. The second-placed athlete scored 6,649 points. By how many points did Ennis increase her lead by the end of the event?

Read carefully!

What are the important numbers?

What are the key words?

What operations do I need?

REMEMBER

Getting ready

Players   2

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

Materials   Game markers for each player, scrap paper, pencils, a deck of cards with the tens and the picture cards taken out. The ace has a value of 1.
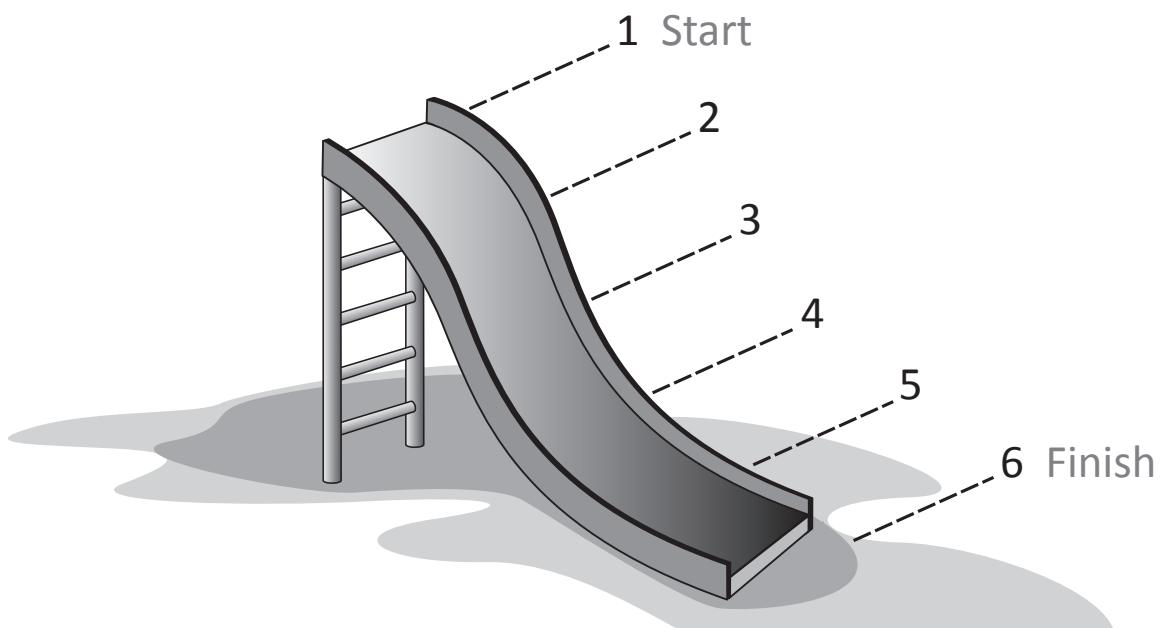
What to do

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

$$
\begin{array}{ccc}
\square & \square & \square \\
+\ \square & \square & \square \\
\hline
\\
\hline
\end{array}
$$

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

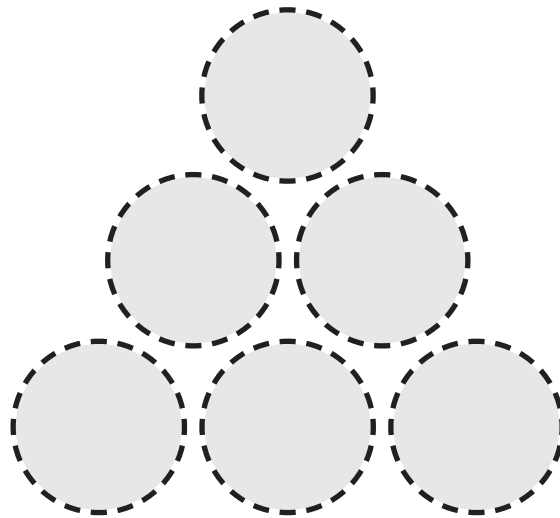**Variations**   Change the number of cards laid out.

1 Start
2
3
4
5
6 Finish

F **3**

SERIES   TOPIC

Addition and Subtraction

What to do

Puzzle 1

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

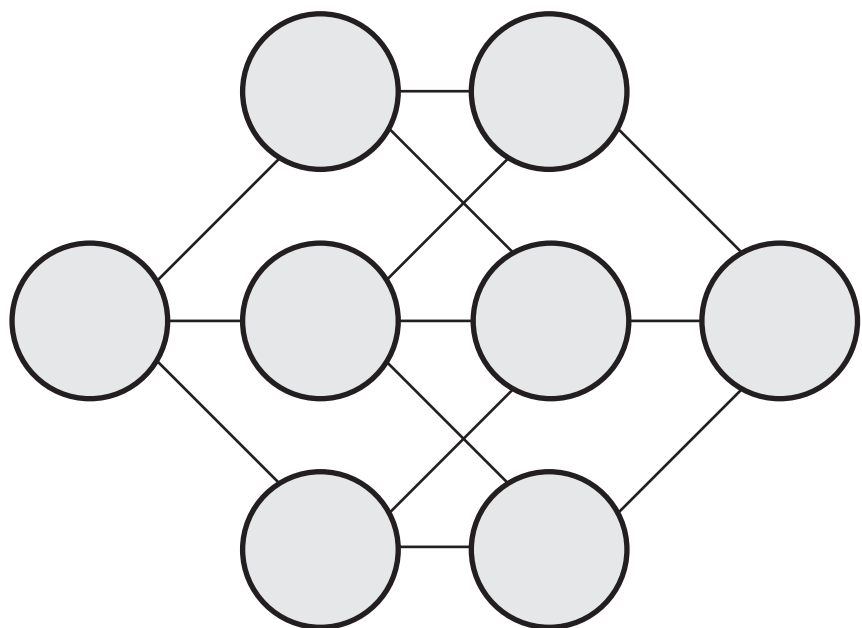$$1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6$$

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

THINK

Puzzle 2

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

Patterns and algebra – recursive number patterns

Look around you, can you see a pattern? A pattern is an arrangement of shapes, numbers or objects formed according to a rule. Patterns are everywhere, you can find them in nature, art, music and even in dance!

In this topic, we are looking at number patterns. A number pattern is a sequence or list of numbers that is formed according to a rule.

Number patterns can use any of the four operations (+, –, ×, ÷) or even a combination.

In the example below, if we follow this instruction: "starting at 1 add 5 each time" we get this number pattern:

| 1 | 6 | 11 | 16 | 21 |

+ 5   + 5   + 5   + 5
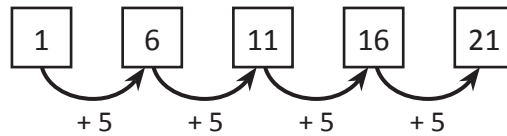
1 Write the next 3 numbers in each sequence by following the rule:

a Rule: add 6   5 → 11 → 17 → ☐ → ☐ → ☐

b Rule: subtract 10   100 → 90 → 80 → ☐ → ☐ → ☐

c Rule: multiply by 2   2 → 4 → 8 → ☐ → ☐ → ☐

2 Figure out the missing numbers in each pattern and write the rule. Circle the ascending patterns.

a   14 21 ☐ 35 42 ☐

Rule _____

b   17 37 57 ☐ ☐ ☐

Rule _____

c   75 ☐ ☐ 30 15 ☐

Rule _____

d   ☐ 16 24 ☐ 40 ☐

Rule _____

e   63 54 ☐ 36 27 ☐

Rule _____

f   63 56 ☐ 42 35 ☐

Rule _____

3 Complete these grid patterns. Look closely at the numbers in the grid and follow the patterns.

a

	32		
40	42		
50	52		

b

		66		
		76		
84				
		96		

c

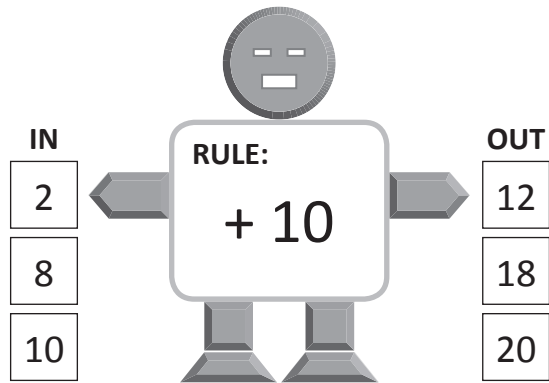|				
3				
		17		
23	25			

Addition and Subtraction
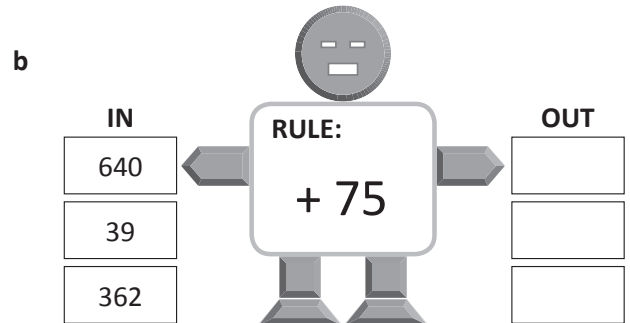
Patterns and algebra – function machines
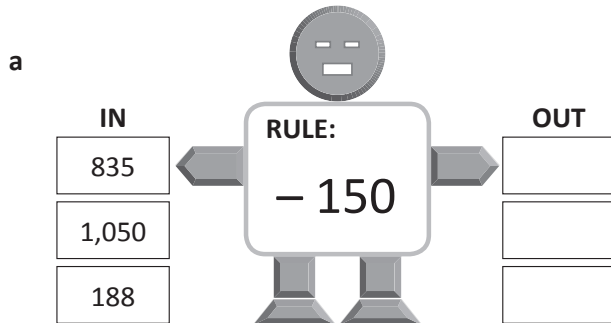
This is a function machine.

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

IN	RULE: **+ 10**	OUT
2		12
8		18
10		20

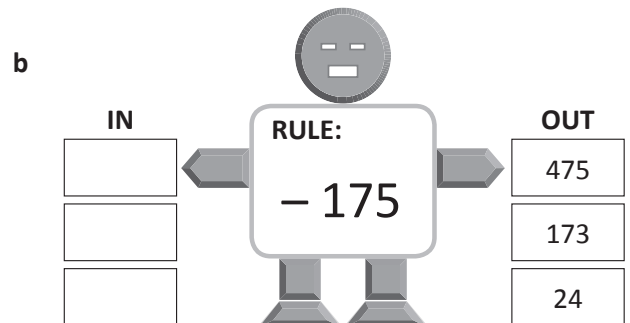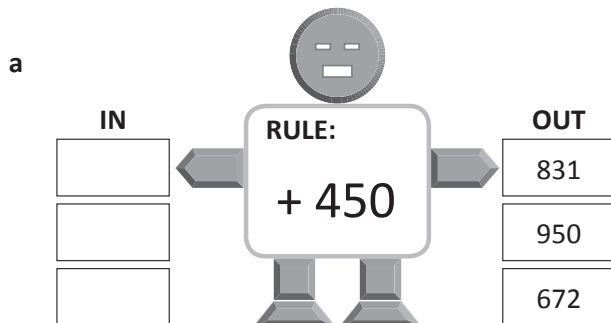**1** Look carefully at the numbers going *in* these function machines and the numbers coming *out*. What rule are they following each time?

a

IN	RULE:	OUT
73		123
129		179
459		509

b

IN	RULE:	OUT
81		281
838		1,038
547		747
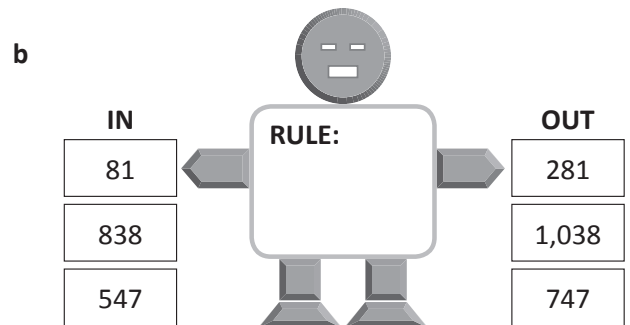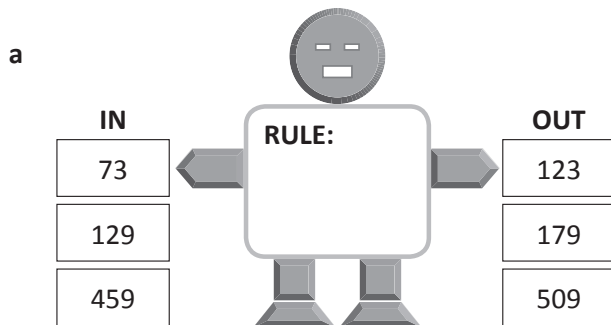
2 What numbers will come *out* of these function machines?

a

IN	RULE: **− 150**	OUT
835		
1,050		
188		

b

IN	RULE: **+ 75**	OUT
640		
39		
362		

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

a

IN	RULE: **+ 450**	OUT
		831
		950
		672

b

IN	RULE: **− 175**	OUT
		475
		173
		24

Patterns and algebra – function tables with addition and subtraction

The function machines showed us that when a number goes in, it comes out changed by the rule or the function. There are many function patterns in real life.

Look at this example:

At their Christmas fair, Middle Street Primary School charges £1.50 for a gift wrapping service. This table shows the total cost of each wrapped gift and shows the rule.

Cost of unwrapped gift	£7	£10	£15	£18
Cost of wrapped gift	£8.50	£11.50	£16.50	£19.50
Rule	Cost of unwrapped gift + £1.50 = Cost of wrapped gift			

1 **Complete the function table for the total cost of a day out at a fun park. You must pay an entry fee of £12 and purchase a wrist band for the amount of rides that you want to go on.**

Wrist band	5 rides for £20	6 rides for £25	7 rides for £30	8 rides for £35
Total admission				
Rule	Wrist band + £12 = Total cost			

2 **Complete the function table for the total cost of lunch at a school canteen. Pupils pay £2.40 for a sandwich and then choose what else they would like. Work out the total cost of lunch for each option.**

Lunch option	Drink: 80 pence	Fruit: 95 pence	Yoghurt: £1.10	Ice lolly: £1.50
Total cost of lunch				
Rule	Lunch option + £2.40 = Total cost of lunch			

3 **5F have fitness every Thursday afternoon for 30 minutes. Each week they complete a fitness activity and then play running games. Work out how much time is left for games after each activity.**

Activity	Skipping 10 minutes	Star jumps 12 minutes	Push ups 15 minutes	Sit ups 16 minutes
Time left for games				
Rule	30 minutes – length of time of activity = Time left for games			

Addition and Subtraction

Patterns and algebra – understanding equivalence

An equation is like a set of balanced scales. Both sides are equal.
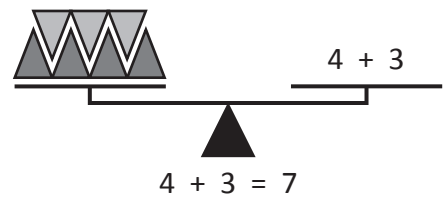Look at the scale on the right.

On one side are 4 black triangles and 3 grey triangles.
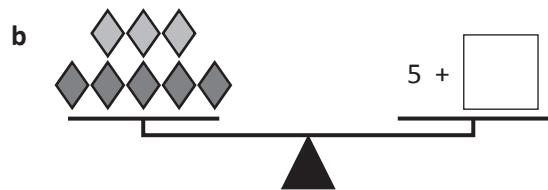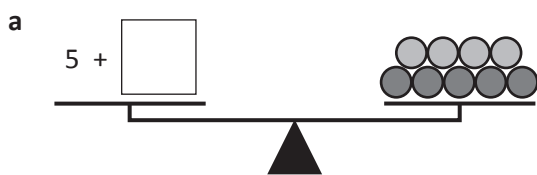On the other side is the problem 4 + 3.
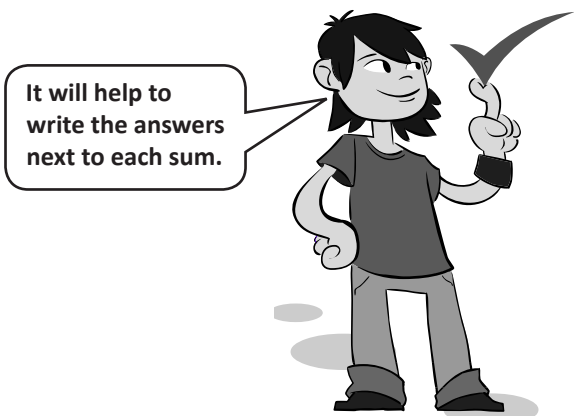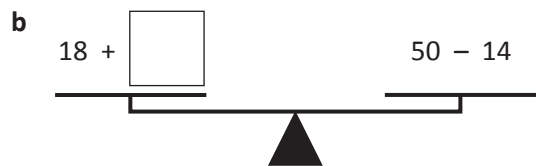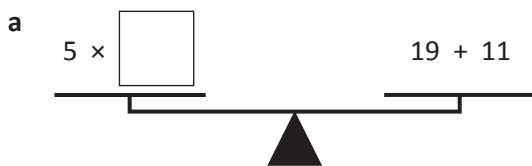Is this a balanced equation?
Yes, because they both represent 7.

4 + 3

4 + 3 = 7

Sometimes, we haven't been given all the information and
we have to work it out. This is what algebra is – solving missing number puzzles.

1 **Make these scales balance by adding the missing value:**

a 5 +

b 5 +

....

2 **These scales have number problems on each side. One side has a complete problem. On the other side, you need to work out the missing value. Write the value in the box so that the scales balance:**

a 5 ×   19 + 11

b 18 +   50 − 14

c 5 × 9   + 15

d   − 5   35 ÷ 7

e 9 ×   100 − 19

It will help to write the answers next to each sum.
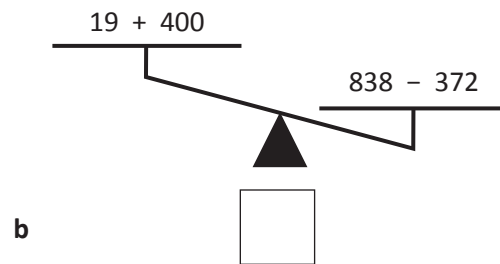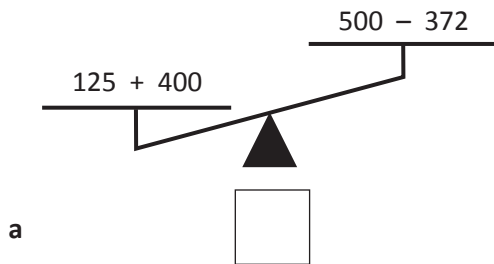
f 33 ÷ 3   22 −

CHECK

Patterns and algebra – understanding equivalence
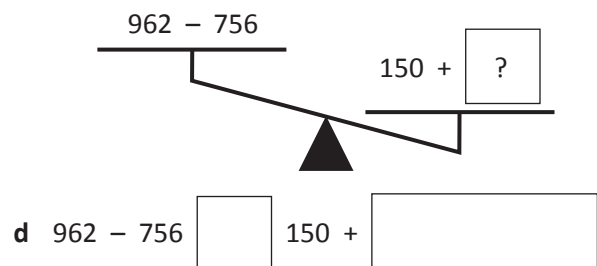
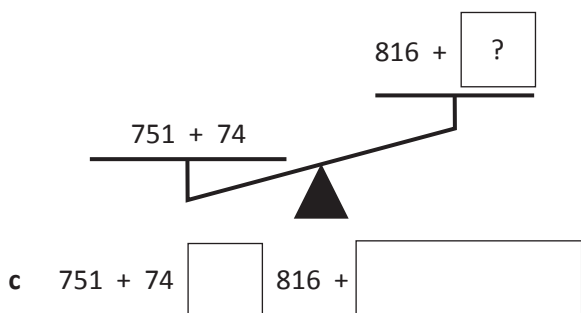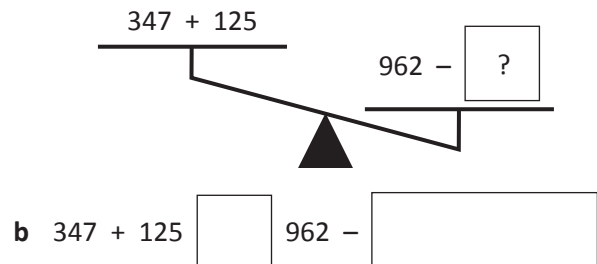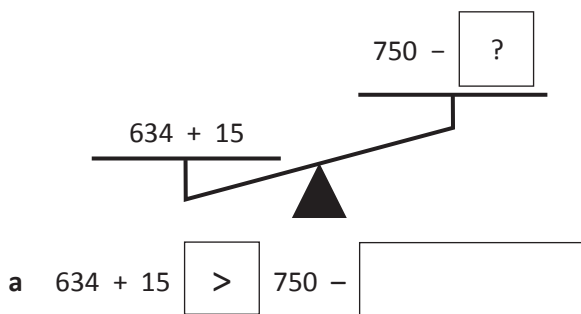If the sides are not balanced, we say the equation is unequal.

Look at these scales: 5 × 4 is greater than 5 + 4

So instead of an equals sign, we use the greater than sign: **5 × 4 > 5 + 4**

3 **Complete the following scales and inequalities by adding greater than (>) or less than (<):**

a

$$500 - 372$$

$$125 + 400$$

b

$$19 + 400$$

$$838 - 372$$

4 **In these problems, you have to add both the symbol *and* a value that would make the equation true. Remember, just like with ordinary scales, the bigger value will be lower down.**

a $750 - \boxed{?}$

$634 + 15$

a $634 + 15 \boxed{>} 750 - \boxed{}$

b $347 + 125$

$962 - \boxed{?}$

b $347 + 125 \boxed{} 962 - \boxed{}$

c $816 + \boxed{?}$

$751 + 74$

c $751 + 74 \boxed{} 816 + \boxed{}$

d $962 - 756$

$150 + \boxed{?}$

d $962 - 756 \boxed{} 150 + \boxed{}$

HINT: there are many values that would work in the boxes!

THINK

F **4**

SERIES   TOPIC

Addition and Subtraction

Patterns and algebra – using symbols

Symbols help us when we have more than one number to find.

A symbol can be any shape and stands for any unknown numbers.

1 Work out the value of the diamond in each question. Notice the same symbol is added 3 times. Your 3 times tables will help here.

a

◇ ◇ ◇   12

☐ + ☐ + ☐ = 12

b

◇ ◇ ◇   36

☐ + ☐ + ☐ = 36

c

◇ ◇ ◇   45

☐ + ☐ + ☐ = 45

2 Find the value of the symbols. Remember that if a symbol is used more than once, it means it is the same value again.

a ☆ + ☆ + ☆ = 9   ☆ = ☐

b ♡ × ♡ = 36   ♡ = ☐

c ☺ × ☺ = 49   ☺ = ☐

Guess, check and improve strategy will help here.

DISCOVER

3 Find the value of the symbols and then check if you are right by using the same value in the question alongside it.

a ◈ × ◈ = 81   ◈ × △ = 36

◈ = ☐   △ = ☐

b ◯ + ✳ + ✳ = 29   ◯ × ✳ = 60

◯ = ☐   ✳ = ☐

Patterns and algebra – using symbols

Known values can help us work out the values of the secret symbols.

Your knowledge of inverse operations will also come in handy.

⊙ = 12

⊙ + ◯ = 20

△ + ◯ = 13

◯ = _____

△ = _____

By knowing the value of ⊙ we can work out ◯

12 + ◯ = 20, so ◯ = 8

By knowing the value of ◯, we can work out △

△ + 8 = 13, so △ = 5

4 Look carefully at the example above and follow the steps to find out the values of these secret symbols:

a ✳ = 15

✳ + ◯ = 40

△ + ◯ = 65

◯ = _____

△ = _____

b ◈ = 54

◈ ÷ ◯ = 9

△ ÷ ◯ = 3

◯ = _____

△ = _____

5 This time you must find the value of 3 different symbols △ ☆ ◯ using the clues in each step:

a ☆ × ☆ = 16

◯ + ☆ = 100

◯ − ☆ = △

☆ = ☐

◯ = ☐

△ = ☐

b △ + △ = 50

△ ÷ ◯ = 5

◯ + △ = ☆

☆ = ☐

◯ = ☐

△ = ☐

c ☆ + ◯ = 20

☆ × △ = 72

13 − △ = 5

☆ = ☐

◯ = ☐

△ = ☐

Addition and Subtraction

Patterns and algebra – using inverse operations

How can we find out the value of the symbol in this equation? We need to make it stand on its own while keeping the equation balanced. This is called the *balance strategy*.

We do this by performing the inverse operation to both sides. Can you see why?

$$\bigstar + 560 = 700$$

$$\bigstar + 560 - 560 = 700 - 560$$

$$\bigstar = 140$$

Doing the inverse cancels out a number and helps get the unknown to stand on its own.

1 **Find out the value of each symbol by performing inverse operations:**

a $\bigcirc + 450 = 900$

$\bigcirc + 450 - \rule{1cm}{0.5pt} = 900 - \rule{1cm}{0.5pt}$

$\bigcirc = \rule{1cm}{0.5pt}$

b $\bigstar - 750 = 820$

$\bigstar - 750 + \rule{1cm}{0.5pt} = 820 - \rule{1cm}{0.5pt}$

$\bigstar = \rule{1cm}{0.5pt}$

c $\triangle + 492 = 743$

$\triangle + 492 - \rule{1cm}{0.5pt} = 743 - \rule{1cm}{0.5pt}$

$\triangle = \rule{1cm}{0.5pt}$

d $\diamond - 755 = 435$

$\diamond - 755 + \rule{1cm}{0.5pt} = 435 + \rule{1cm}{0.5pt}$

$\diamond = \rule{1cm}{0.5pt}$

2 **Find out the value of each symbol again. Perform the inverse operation in fewer steps.**

a $\smiley + 640 = 982$

$\smiley = 982 - \rule{1cm}{0.5pt}$

$\smiley = \rule{1cm}{0.5pt}$

b $\smiley - 627 = 255$

$\smiley = 255 + \rule{1cm}{0.5pt}$

$\smiley = \rule{1cm}{0.5pt}$

3 **Find out the value of each symbol by following the same steps as above. Set your work out neatly:**

a $\bigcirc + 704 = 853$

b $\bigcirc - 956 = 102$

Patterns and algebra – using inverse operations

Sometimes the symbol is not at the beginning so you have to rearrange the equation by performing an inverse operation. This is because it is easier to solve when the symbol is on the left hand side of the equals sign.

$$12 = 78 - \blacktriangle$$

Step 1 Move the symbol to the left with an inverse operation. The inverse of $+ \blacktriangle$ is $- \blacktriangle$:

$$12 + \blacktriangle = 78 - \blacktriangle$$

Step 2 Make the symbol stand alone with an inverse operation. To do this, subtract 12 from both sides:

$$12 + \blacktriangle = 78 - 12$$

Step 3 Now we can perform a simple subtraction to find out the value of the symbol:

$$\blacktriangle = 78 - 12$$
$$\blacktriangle = 66$$

4 **Follow the steps outlined above to find the value of the symbol.**

a $\qquad$ 23 = 56 − $\blacktriangle$

$\boxed{}$ + $\blacktriangle$ = $\boxed{}$

$\blacktriangle$ = $\boxed{}$ − $\boxed{}$

$\blacktriangle$ = $\boxed{}$

b $\qquad$ 32 = 78 − $\blacktriangle$

$\boxed{}$ + $\blacktriangle$ = $\boxed{}$

$\blacktriangle$ = $\boxed{}$ − $\boxed{}$

$\blacktriangle$ = $\boxed{}$

c $\qquad$ 36 = 112 − $\blacktriangle$

$\boxed{}$ + $\blacktriangle$ = $\boxed{}$

$\blacktriangle$ = $\boxed{}$ − $\boxed{}$

$\blacktriangle$ = $\boxed{}$

d $\qquad$ 52 = 105 − $\blacktriangle$

$\boxed{}$ + $\blacktriangle$ = $\boxed{}$

$\blacktriangle$ = $\boxed{}$ − $\boxed{}$

$\blacktriangle$ = $\boxed{}$

e $\qquad$ 26 = 78 − $\blacktriangle$

f $\qquad$ 14 = 92 − $\blacktriangle$

Addition and Subtraction

Patterns and algebra – word problems

If you can solve equations with one unknown number using the balance strategy, you will be able to solve word problems with ease!

A large group of friends signed up to participate in a fun run. 56 of them got food poisoning the day before so had to pull out.
How many people signed up if a total of 84 people ran the race?

$$\star - 56 = 84$$

$$\star - 56 = 84 + 56$$

$$\star = 140$$

To get the star on its own we use the inverse operation and do the same to the other side.

REMEMBER

1 Solve the following word problems using inverse operations. Start by choosing the matching equation from the box below.

£50 + △ = £130   △ − 70 m = 38 m   £83 + £100 + △ = £300

a   Jack had a piece of rope and cut off 70 metres. He was left with 38 metres. How long was the rope?

b   Tom found £50 on the bus on Monday and was given birthday money by his Gran on Wednesday. How much did his Gran give him if he ended up with £130?

c   Matilda saved £83 towards a trip to the snow and her parents gave her £100. How much more money does she need if the trip costs £300?