BAR MODELS
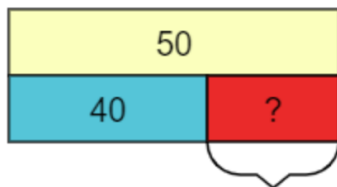
A guide to using bar models to solve word problems
in LKS2
Years 3 & 4
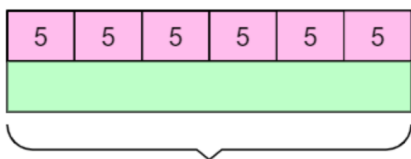
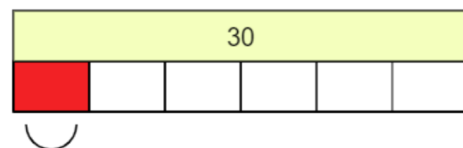50 - 40=   50 + 40 =

| 50 | |
| 40 | ? |

| 50 | 40 |
| | |

6 x 5 =   30 ÷ 6 =

| 5 | 5 | 5 | 5 | 5 | 5 |
| | |

| 30 | | | | | |

BAR MODELS

In this course we will look at how the bar model is used to help solve word problems.

CONTENTS

For each topic there is a lesson video and a worksheet. There are 2 worksheets available for some objectives, which are aimed at Year 3 & 4. They use 1 dot or 2 dots Use the worksheet that your child feels more comfortable with. Both explore the concept of bar models in the same way but the difficulty of the calculations will be linked to the year group.
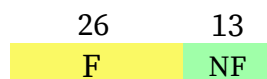
▶ Click the video icon or scan the QR code to watch the lesson video.
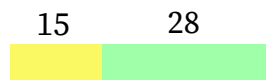
Using bar models for word problems: addition

PRACTICE WITH ME

Leo has 26 fiction books and 13 non fiction books.
How many books does he have altogether?

26	13
F	NF

$$26$$
$$+ 13$$

Susie has 15 fish and then buys 28 more.
How many fish does she have now?

15	28

$$15$$
$$+ 28$$

HAVE A GO!
Draw your own bars to show how you would solve the problem and write the calculation out too.

Ingrid has 26 stickers and she collects 19 more.
How many stickers does she have in total?

Alice scores 17 points on a game before lunch and 29 points after lunch.
How many points did she score altogether?

Daniel has read 76 pages of his story so far.
He reads another 22.
How many pages has he read in total?

Raya has collected 36 bottle tops for a school project.
Her aunty gives her another 26.
How many does she have now?

▶ **WATCH OUT!**

Lisa has saved £28 and Barry has saved £40.
How much more has Barry saved?
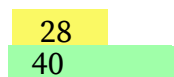
28
40

$$40$$
$$- 28$$

HAVE A GO! Which questions are addition questions? Tick them and solve them.

✔   ✘

Scott walked 15km and Isaac walked 32 km.
How much more has Isaac walked?

Kye spent £18 in a shop and his friend Mia spent £9 more than him.
How much did they spend altogether?

A length of string measured 40cm. Christopher needed 16cm
of string and Leo needed 18cm of string. Was there enough
string for them both?

Yazmin poured 300ml of squash from a 1 litre jug. Ben poured
out some squash and there was 300ml left. How much more
did Ben pour than Yazmin?

scan for tutorial

3

How confident do you feel?

Using bar models for word problems: addition

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How many books does he have altogether?

26	13
F	NF

26
+ 13
——
——

Susie has 15 fish and then buys 28 more.
How many fish does she have now?

| 15 | 28 |

15
+ 28
——
——

HAVE A GO!
Draw your own bars to show how you would solve the problem and write the calculation out too.

Ingrid has 2176 stickers and she collects 189 more.
How many stickers does she have in total?

Alice scores 1327 points on a game before lunch and 1295 points after lunch.
How many points did she score altogether?

Daniel has read 756 pages of his story so far.
He reads another 232.
How many pages has he read in total?

Raya has collected 326 bottle tops for a school project.
Her aunty gives her another 276.
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scan for tutorial

► **WATCH OUT!**

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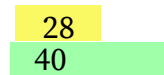
| 28 |
| 40 |

40
- 28
——
——

HAVE A GO! Which questions are addition questions? Tick them and solve them.
✔   ✗

Scott walked 85km and Isaac walked 92 km.
How much more has Isaac walked?

Kye spent £1238 in a shop and his friend Mia spent £79 more than him.
How much did they spend altogether?

A length of string measured 4 metres long. Christopher
needed 186 cm of string and Leo needed 198 cm of string.
Was there enough string for them both?

Yazmin poured 325ml of squash from a 1 litre jug. Ben poured
out some squash and there was 208 ml left.
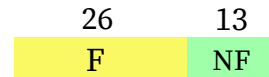How much more did Ben pour than Yazmin?

4

How confident do you feel?

scan for tutorial

There are 52 children on a bus. 17 get off at the first stop.
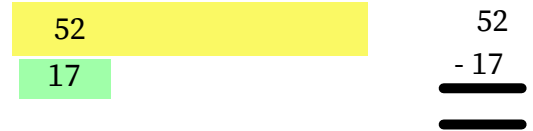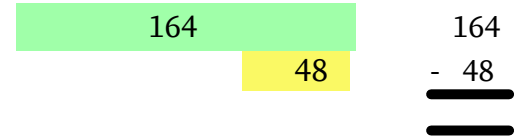How many are left on the bus?

| 52 |
| 17 |

$$\begin{array}{r} 52 \\ -\ 17 \\ \hline \\ \hline \end{array}$$
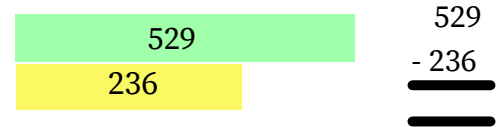
A shop has 164 copies of the latest book for sale.
The next day they have 48 books to sell.
How many books did they sell on the first day?

| 164 |
| 48 |

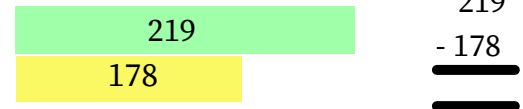$$\begin{array}{r} 164 \\ -\ 48 \\ \hline \\ \hline \end{array}$$

▶ WATCH OUT!

Altogether, Jamie and Sacha clean up 529 pieces of plastic from their local beach. Sacha collected 236 pieces.
How much did Jamie collect?

| 529 |
| 236 |

$$\begin{array}{r} 529 \\ -\ 236 \\ \hline \\ \hline \end{array}$$

Sofia earned 178 coins on TT Rockstars but Isla scored 219.
How much more did Isla score?

| 219 |
| 178 |

$$\begin{array}{r} 219 \\ -\ 178 \\ \hline \\ \hline \end{array}$$

HAVE A GO! Draw your own bars to show how you would solve the problem and write the calculation out too. Ypu will need more paper to do your working out on.

1) Daniel's book has 978 pages. He has read 212 pages.
How many more pages does he have left to read?

2) Raya and her friends made 455 cakes for the cake sale. They sold 296 in the first hour.
How many do they have left?

3) Lydia is doing a sponsored walk. Her target is 8000 metres. She has 525 metres left to walk.
How far has she walked so far?

4) Kye has 856 coins in his TT Rockstars account. He bought a new guitar and now he has 275 coins. **How much was the guitar?**

5) Juliette needs 675 cm of string for her project. The string she has found is 189cm too short.
How long is her string?

6) Yazmin and Ben pour 655ml of squash from a 1 litre jug (1000ml).
How much squash is left?

7) Lisa and Barry want to raise £950 for charity. They have raised £418 so far.
How much more do they need to raise?

8) A supermarket sells more green apples than red apples. They sell 567 green apples and 129 less red apples.
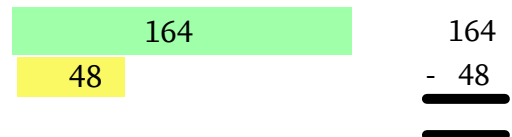**How many red apples did they sell?**

5

How confident do you feel?

scan for tutorial

PRACTICE WITH ME ▶

There are 52 children on a bus. 17 get off at the first stop.
How many are left on the bus?

| 52 |
| 17 |

52
- 17
___
___
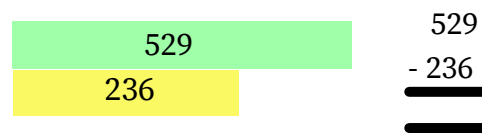
A shop has 164 copies of the latest book for sale.
The next day they have 48 books to sell.
How many books did they sell on the first day?
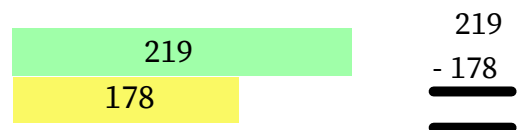
| 164 |
| 48 |

164
- 48
___
___

WATCH OUT! ▶

Altogether, Jamie and Sacha clean up 529 pieces of plastic from their local beach. Sacha collected 236 pieces.
How much did Jamie collect?

| 529 |
| 236 |

529
- 236
___
___

Sofia earned 178 coins on TT Rockstars but Isla scored 219.
How much more did Isla score?

| 219 |
| 178 |

219
- 178
___
___

HAVE A GO! Draw your own bars to show how you would solve the problem and write the calculation out too. Ypu will need more paper to do your working out on.

1) Ava's game has 3978 challenges to complete. She has completed 1212 challenges.
How many more challenges does she have left to complete? 🖊

2) A Year 4 class made 2455 cakes for a cake sale. They sold 1296 in the first hour.
How many do they have left to sell? 🖊

3) Lydia is doing a sponsored run. Her target is 10km (10,000 metres). She has 1525 metres left to run.
**How far has she run so far?** 🖊

4) Kye has 7856 coins in his TT Rockstars account. He purchases lots of new accessories and now has 275 coins left. **How much did he spend?** 🖊

5) Juliette needs 5675 lego bricks to build a structure. She still needs another 1285 bricks.
Howmany lego bricks does she have? 🖊

6) A garden centre uses 10 litres (10,000ml) of water every day to water their plants.
The gardener has used 8106ml so far.
How much water is left? 🖊

7) A group of friends want to raise £9500 for charity. They have £1209 until they reach stheir target.
How much have they raised? 🖊

8) Jenna answered 3175 times-table questions last month. Ismail answered 2099 questions last month.
How many more questions did Jenna answer than Ismail? 🖊

● ●

6

How confident do you feel?
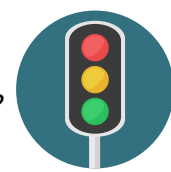
Using bar models for word problems: multiplication

PRACTICE WITH ME ▶

Rita buys 8 cinema tickets for £12 each. ▶
How much do the tickets cost?

There are 6 cookies in a packet. Mrs Flinders buys 9 packets for a coffee morning. ▶
How many cookies will there be altogether?

scan for tutorial

HAVE A GO- use some paper to show your working out

1) In a day, a farmer sells 11 sacks of potatoes. Each sack weighs 10kg.
How many kg of potatoes did the farmer sell?

2) A vlogger got an average of 7 likes every minute on a video they posted.
How many likes did they get in 15 minutes?

3) It takes 16 hours for a satellite to orbit around the Earth once.
How many hours would it take to orbit the Earth 9 times?

4) Every day, a farmer sells 18 trays of a half-dozen eggs (6 eggs).
How many eggs are sold altogether in a day?

PRACTICE WITH ME ▶

Marc waters some plants. He gives each plant 5cl of water. ▶
After 14 plants he has 2cl left. How much water did he start with?

Amy sold 19 cakes for £2 each. She had to pay £1.50 for posters to ▶
advertise the cake sale. How much profit did she make?

HAVE A GO- use some paper to show your working out

5) A group of 12 friends set out to walk 5 kilometres for charity. They all completed the journey
except for one of the friends, who only walked 1 km.
What is the total distance they walked altogether?

6) Jacob puts up a shelf which will hold 2kg (2000g). He puts 6 books on the shelf, which weigh 250g each.
How much of the weight limit is left on the shelf?

7) Each table in the lunch hall sits 10 children. One lunchtime, 6 of the tables are full but there
are only 8 children on the 7th table.
How many children are eating lunch?

8) Tickets to a school play are £12 each. A family buys 6 tickets and pays £75.
How much change do they get back?

7

How confident do you feel?

Using bar models for word problems: multiplication

scan for tutorial

PRACTICE WITH ME ▶

Rita buys 8 cinema tickets for £12 each. ▶
How much do the tickets cost?

There are 6 cookies in a packet. Mrs Flinders buys 9 packets for a coffee morning. ▶
How many cookies will there be altogether?

HAVE A GO- use some paper to show your working out

1) Every week, a farmer sells an average of 85 sacks of potatoes. Each sack weighs 9kg.
How many kg of potatoes does the farmer sell each week?

2) A vlogger gets an average of 9 likes every minute on a video they posted.
How many likes did they get in 2 hours?

3) It takes 960 minutes for a satellite to orbit around the Earth once.
How many minutes would it take to orbit the Earth 9 times?

4) Every week, a farmer sells 125 trays of a half-dozen eggs (6 eggs).
How many eggs are sold altogether each week?

PRACTICE WITH ME ▶

Marc waters some plants. He gives each plant 5cl of water. ▶
After 14 plants he has 2cl left. How much water did he start with?

Amy sold 19 cakes for £2 each. She had to pay £1.50 for posters to ▶
advertise the cake sale. How much profit did she make?

HAVE A GO- use some paper to show your working out

5) A group of 78 children set out to walk 8 kilometres for charity. They all completed the journey
except for one of the children who got an injury. They managed to complete 3 km.
What is the total distance they walked altogether?

6) Jacob puts up 9 trophies on a shelf, which weigh 355g each. His shelf can hold 4kg (4000g)
How much of the weight limit is left on the shelf?

7) Each table in the lunch hall sits 16 children. One lunchtime, 9 of the tables are full but there are
only 14 children on the 10th table.
How many children are eating lunch?

8) Tickets for front row at the theatre are £56 each. A group buys 8 tickets and pays £500.
How much change do they get back?

How confident do you feel?

Using bar models for word problems: division

PRACTICE WITH ME ▶

A vlogger received 84 views on a video they posted one week. ▶
What is the average daily view of the video?

A fundraising event raised £369. The money is shared equally among 3 local charities. ▶
How much does each charity receive?

HAVE A GO- use some paper to show your working out

Q1) Anna has collected 90 football cards and puts them in a special book.
She can fit 10 cards on each page.
a)How many pages in her book are full?

Q2) A pencil factory makes 55 pencils.
The pencils are sold in packs of 5.
How many packs can they sell?

Q3) Daffodils are arranged into bunches of 8 flowers.
A florist receives a delivery of 56 daffodils.
How many bunches of 8 daffodils can be made?

PRACTICE WITH ME ▶

54 people turn up to a football match. Each bench can fit 5 people on. ▶
a) How many benches are full?   **b) How many people on the last bench?**

Hetty bakes 70 cupcakes for a cake sale. She puts 6 cupcakes in each gift-box. ▶
a) How many gift-boxes can she make?   **b) How many spare cupcakes does she have?**

HAVE A GO- use some paper to show your working out

Q4) A local youth club has £47 in their account.
They want to purchase some new painting sets which cost £4 each.
a) How many painting sets can they buy?
b) How much money will they have left in their account?

Q5) Year 3 & 4 are going on a school trip and need to book some mini-buses.
Each minibus holds 8 passengers. There are 60 children and 8 adults.
a) **How many mini-buses are full?**
b) How many people are there in the last mini-bus?

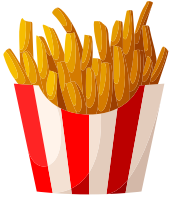Q6) Stephen and Barbara pick 78 strawberries on a farm. A punnet holds 8 strawberries.
a) How many full punnets do they have?
b) How many strawberries are there in the last punnet?
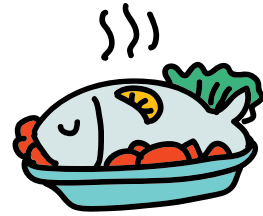
How confident do you feel?

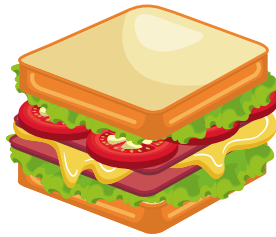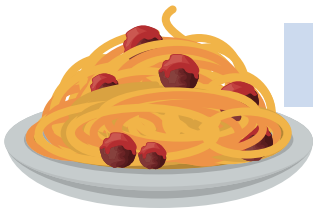# Using bar models for multi-step word problems

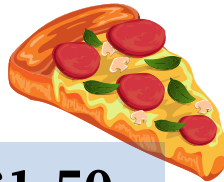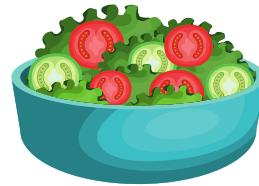£1.25

£?

£3.05

£0.85

£2.45

£0.95

£3.75

£1.50

£1.45

PRACTICE WITH ME ▶

Adam bought chips and a can of soda.
How much change did he get from £5?

Lucy bought fish and some crisps. She gets £2.70 change.
How much did she pay with?

How much less did Adam spend than Lucy?

scan for tutorial

▶ **CHALLENGE QUESTION**

James buys pizza, chips and a can of soda.
Lisa spends £1.50 less than James and buys 2 wraps.
How much does a wrap cost?

HAVE A GO- Use the menu below to answer some questions, use some paper to show your working out

1) Hima bought a sandwich and a salad. How much change did she get from £5?
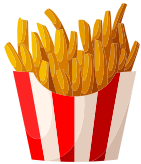
2a) Ryan bought spaghetti and a can of soda. He gets £5.30 change. How much did he pay with?

2b) How much less did Hima spend than Ryan?

3) Xavier spent £5.85. He bought spaghetti, chips and one other item? What else did he buy?

4) Jenny has £10 to spend. She buys 3 items and gets £5.80 change. What 3 items could she have bought?
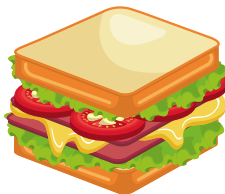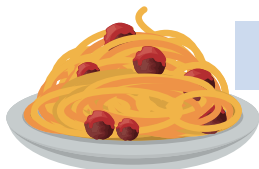
£?

£1.25   £3.05

£0.85   £2.45   £0.95

£3.75   £1.50   £1.45

CHALLENGE QUESTION

5) Anna buys fish, a sandwich and a packet of crisps. Jason spends £1.55 less than Anna and buys 4 wraps. How much does one wrap cost?

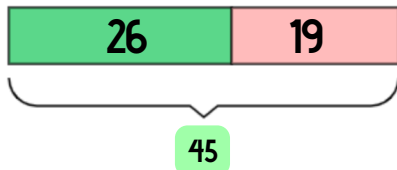6) What costs more? 2 sandwiches or 5 cans of soda?

11

How confident do you feel?

Ingrid has 26 stickers and she collects 19 more.
How many stickers does she have in total? **45**

26	19

45

Alice scores 17 points on a game before lunch and 29 points after lunch.
How many points did she score altogether? **46**
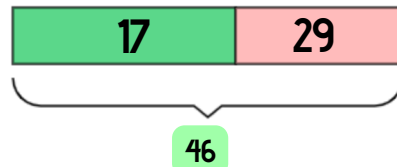
17	29

46

Daniel has read 76 pages of his story so far.
He reads another 22.
How many pages has he read in total? **98**
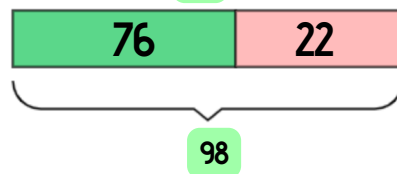
76	22

98

Raya has collected 36 bottle tops for a school project.
Her aunty gives her another 26.
How many does she have now? **62**

36	26

62
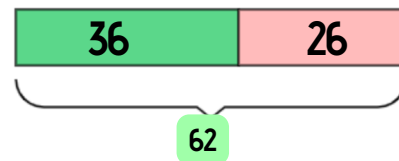
Scott walked 15km and Isaac walked 32 km. ✗
How much more has Isaac walked?

32 – 15
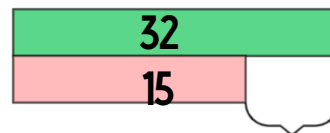
32
15

Kye spent £18 in a shop and his friend Mia spent £9 more than him. ✓
How much did they spend altogether?

18
18 + 9 = 27
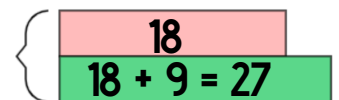
A length of string measured 40cm. Christopher needed 16cm ✓
of string and Leo needed 18cm of string. Was there enough
string for them both?

16cm + 18 cm = 34cm

16cm	18cm
40cm	

Yazmin poured 300ml of squash from a 1 litre jug. Ben poured ✗
out some squash and there was 300ml left. How much more
did Ben pour than Yazmin?

400ml - 300ml= 100ml

1000ml	
300ml	300ml

Ben poured
400ml

12
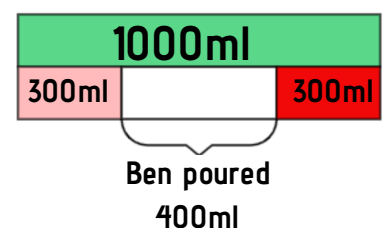
Using bar models for word problems: addition

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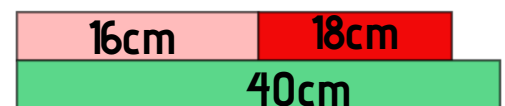How many stickers does she have in total? **2365**
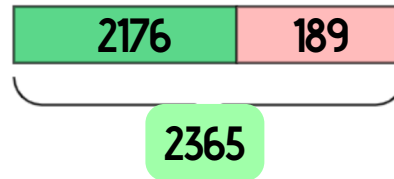
| 2176 | 189 |

2365

Alice scores 1327 points on a game before
lunch and 1295 points after lunch.
How many points did she score altogether?

| 1372 | 1295 |

2667

Daniel has read 756 pages of his story so far.
He reads another 232.
How many pages has he read in total?

| 756 | 232 |
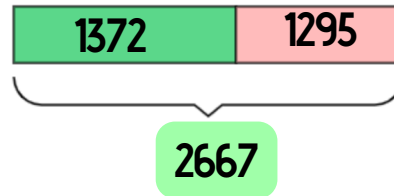
988

Raya has collected 326 bottle tops for a school project.
Her aunty gives her another 276.
How many does she have now?

| 326 | 276 |

602

Scott walked 85km and Isaac walked 92 km. ✗
How much more has Isaac walked?

92 - 85

Kye spent £1238 in a shop and his friend Mia spent £79 more than him.
How much did they spend altogether? ✓

| 1238 |
| 1317 |

1238 + 79 = 1317

A length of string measured 4 metres long. Christopher ✓
needed 186 cm of string and Leo needed 198 cm of string.
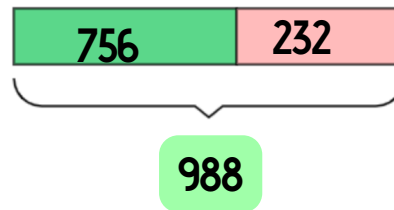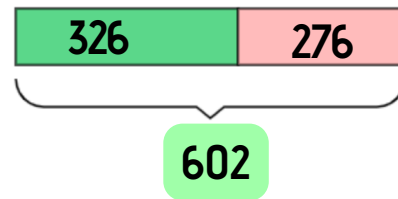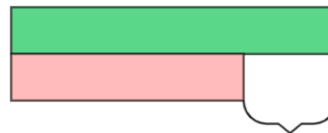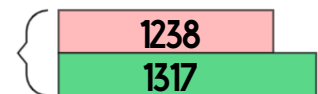Was there enough string for them both?

| 186cm | 198cm |
| 400cm |

186cm + 198cm = 384cm

Yazmin poured 325ml of squash from a 1 litre jug. ✗
Ben poured out some squash and there was 208 ml left.
How much more did Ben pour than Yazmin?

1000ml - 325 - 208=

13

1) Daniel's book has 978 pages. He has read 212 pages.
How many more pages does he have left to read?
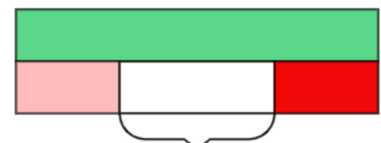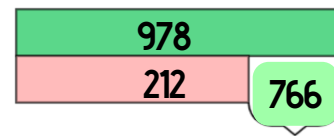
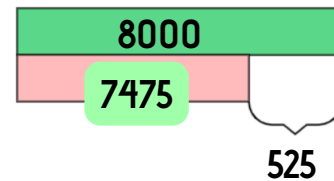| 978	
212	766

2) Raya and her friends made 455 cakes for the cake sale. They sold 296 in the first hour.
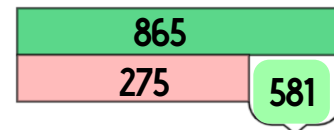**How many do they have left?**

455	
296	159

3) Lydia is doing a sponsored walk. Her target is 8000 metres. She has 525 metres left to walk.
How far has she walked so far?

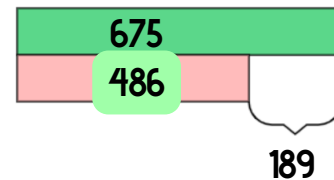| 8000	
7475	525

4) Kye has 856 coins in his TT Rockstars account. He bought a new guitar and now he has 275 coins. **How much was the guitar?**

865	
275	581

5) Juliette needs 675 cm of string for her project. The string she has found is 189cm too short.
How long is her string?

675	
486	189

6) Yazmin and Ben pour 655ml of squash from a 1 litre jug (1000ml).
How much squash is left?

1000	
655	345

7) Lisa and Barry want to raise £950 for charity. They have raised £418 so far.
How much more do they need to raise?

950	
418	532

8) A supermarket sells more green apples than red apples. They sell 567 green apples and 129 less red apples.
How many red apples did they sell?

567	
438	129

14

ANSWERS: Using bar models for word problems: subtraction

1) Ava's game has 3978 challenges to complete. She has completed 1212 challenges.
How many more challenges does she have left to complete?

| 3978 |
| 1212 |

2766

2) A Year 4 class made 2455 cakes for a cake sale. They sold 1296 in the first hour.
How many do they have left to sell?

| 2455 |
| 1296 |

1159

3) Lydia is doing a sponsored run. Her target is 10km (10,000 metres). She has 1525 metres left to run.
How far has she run so far?

| 10,000 |
| 8475 |

1525

4) Kye has 7856 coins in his TT Rockstars account. He purchases lots of new accessories and now has 275 coins left. **How much did he spend?**
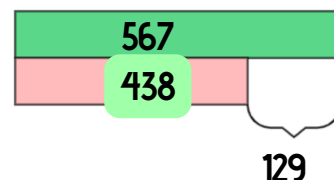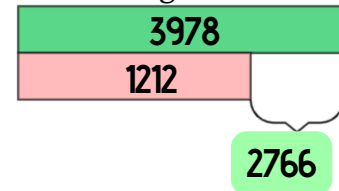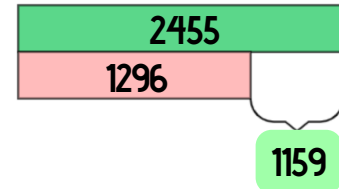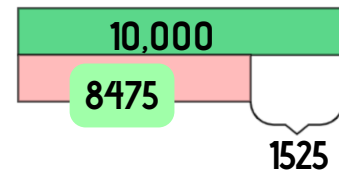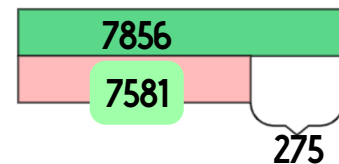
| 7856 |
| 7581 |

275

5) Juliette needs 5675 lego bricks to build a structure. She still needs another 1285 bricks.
Howmany lego bricks does she have?

| 5675 |
| 1285 |

4390

6) A garden centre uses 10 litres (10,000ml) of water every day to water their plants.
The gardener has used 8106ml so far.
How much water is left?

| 10,000 |
| 8106 |

1894

7) A group of friends want to raise £9500 for charity. They have £1209 until they reach their target.
How much have they raised?

| 9500 |
| 8291 | 1209 |

8) Jenna answered 3175 times-table questions last month. Ismail answered 2099 questions last month.
How many more questions did Jenna answer than Ismail?

| 3175 |
| 2099 | 1076 |

1

10kg	10kg	10kg	10kg	10kg	10kg	10kg	10kg	10kg	10kg	10kg

110 kg

2

7	7	7	7	7	7 x 10 = 70

$15 \times 7 = 5 \times 7 + 70 = 105$

3

16	16	16	16	16	16	16	16	16

$9 \times 16 = 144$
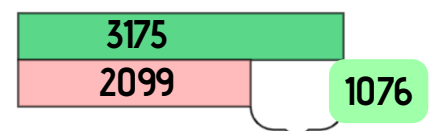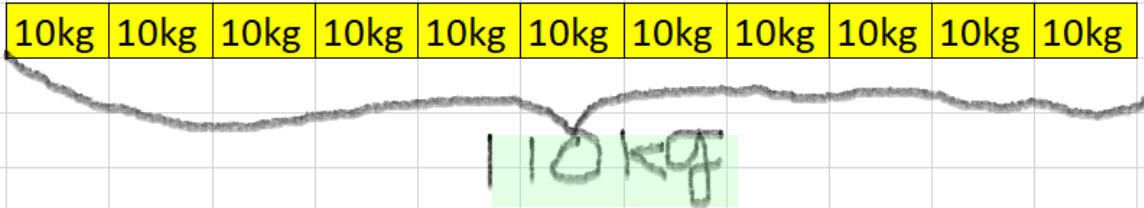
4

6	6	6	12 x 6 = 72	6	6	6

$18 \times 6 = 72 + 6 \times 6 = 108$

5

11 x 5km = 55	1 km

56 km

6

2000g

250g	250g	250g	250g	250g	250g

1500

500

7

10	10	10	10	10	10	8

6 x 10 + 8 = 68

8

£75

12	12	12	12	12	12	?

72

3

1

9	9	9	9	9	80 x 9

$$85 \times 9 = 765$$

2

100 x 9	20 x 9

$$120 \times 9 = 1080$$

3

960	960	960	960	960	960	960	960	960

$$960 \times 9 = 8640$$

4

6	6	6	6	6	120 x 6

$$125 \times 6 = 750$$

5

77 x 8km	3km

$$77 \times 8 + 3 = 619$$

6

4000g

355g	355g	355g	355g	355g	355g	355g	355g	355g

$$(355g \times 9) \quad 3195g + 805g = 4000g$$

7

16	16	16	16	16	16	16	16	16	14

$$9 \times 16 + 14 = 158$$

8

£500

£56	£56	£56	£56	£56	£56	£56	£56	?

How confident do you feel?

Q1)How many pages in her book are full? 9

						90					
9	9	9	9	9	9	9	? 9	? 9	? 9		
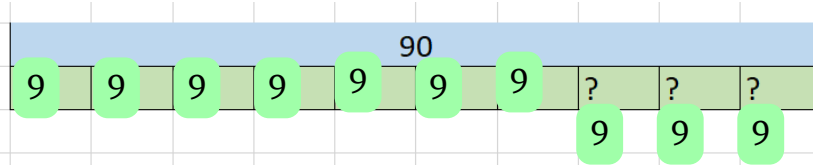
Q2) How many packs can they sell? 11

	55			
11	11	11	11	11
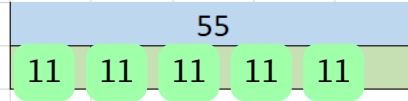
Q3) How many bunches of 8 daffodils can be made? 7

	56						
7	7	7	7	7	7	7	7
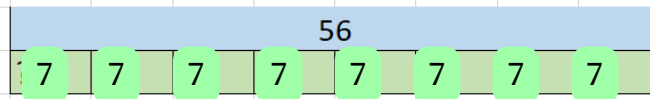
Q4) a) How many painting sets can they buy? 11
b) How much money will they have left in their account? |£3

				£47							
£4	£4	£4	£4	£4	£4	£4	£4	£4	£4	£4	£3
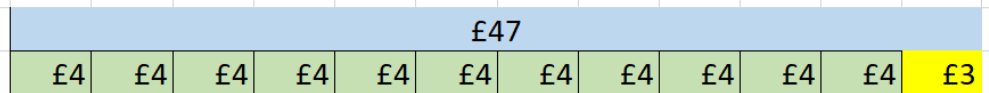
11 x 4 = 44

Q5) a) How many mini-buses are full? 8
b) How many people are there in the last mini-bus? |4

			60 + 8 = 68					
8	8	8	8	8	8	8	8	4
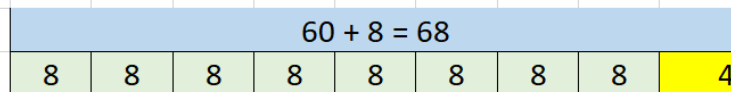
8 x 8 = 64

Q6) a) How many full punnets do they have? 72
b) How many strawberries are there in the last punnet |64
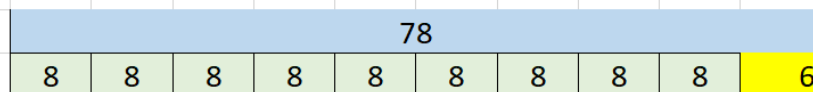
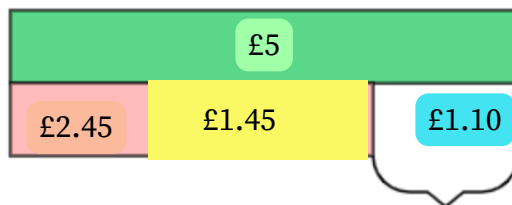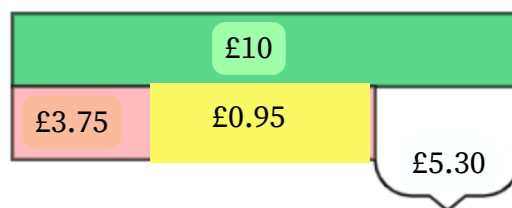|			78					
8	8	8	8	8	8	8	8	6

8 x 9 = 72

How confident do you feel?

1) Hima bought a sandwich and a salad. How much change did she get from £5? £1.10

£5

£2.45 | £1.45 | £1.10

2a) Ryan bought spaghetti and a can of soda. He gets £5.30 change. How much did he pay with? £10

£10

£3.75 | £0.95

£5.30

2b) How much less did Hima spend than Ryan? £0.80

£4.70

£3.90 | £0.80
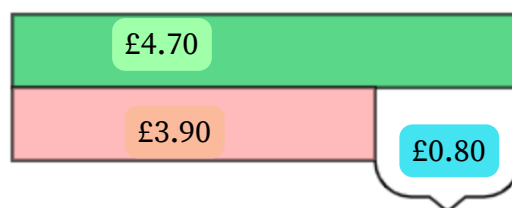
3) Xavier spent £5.85. He bought spaghetti, chips and one other item? What else did he buy?
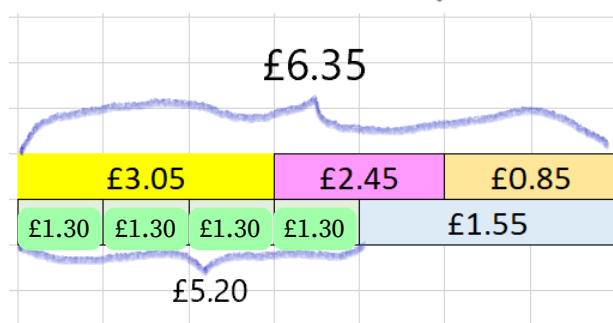
crisps

£5.85

£3.75 | £1.25 | £0.85
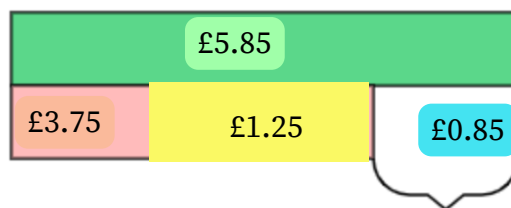
4) Jenny has £10 to spend. She buys 3 items and gets £5.80 change. What 3 items could she have bought?

Any 3 items that total £4.20
example= pizza + salad + chips

£10

£5.80

5) How much does one wrap cost? £1.30

£6.35

£3.05 | £2.45 | £0.85
£1.30 | £1.30 | £1.30 | £1.30 | £1.55

£5.20

6) What costs more? 2 sandwiches or 5 cans of soda?

2 sandwiches

£4.90

£2.45 | £2.45
£0.95 | £0.95 | £0.95 | £0.95 | £0.95

£4.75

19

How confident do you feel?