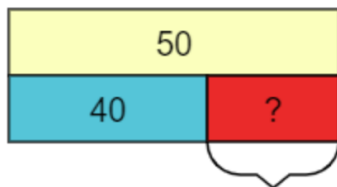


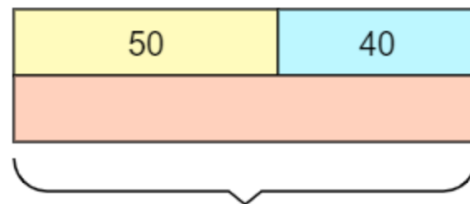
# BAR MODELS

How to use bar models to solve word problems in UKS2  
Years 5 & 6

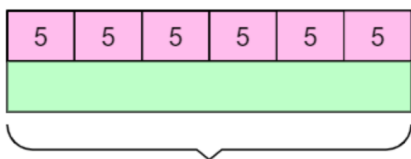
$$50 - 40 =$$



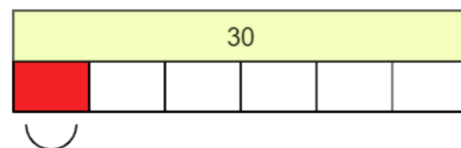
$$50 + 40 =$$



$$6 \times 5 =$$



$$30 \div 6 =$$








# BAR MODELS

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



## CONTENTS

- addition & subtraction  page
- multiplication  page
- division  page
- All operations-measurement  page
- Fractions  page

For each topic there is a lesson video and at least one worksheet. Click on the video icon above OR scan the QR code to view each video tutorial.

Your child should be able to use the video independently to guide them through the worksheet. There are practice with me sections and then activities to try on their own. All answers are included.



Click the video icon or scan the QR code to watch the lesson video.



# Using bar models for word problems: addition and subtraction



## PRACTICE WITH ME

7312 people went to a football match in Brighton. and 6429 went to a match in Crawley.

- How many more went to Brighton?
- How many people went to both matches altogether?

a)

7312	7312
6429	- 6429
	<u>      </u>

b)

7312	6429	7312
		+ 6429
		<u>      </u>

Louise and her twin brother Liam have saved the same amount of birthday money.

Louise buys a new tablet for £178 and now has £552.75. Liam only spent £126.99 on his tablet.

- How much did they both start with?
- How much does Liam have left now?

	↔	
178		126.99
552.75		?

552.75		- 126.99
+ 178		
<u>      </u>		<u>      </u>

There were 3175 people at an exhibition. There were 2065 adults and the rest were children.

There were 110 more girls than boys.

How many boys were there?

3175	Children
2065	boys and girls
children	110 extra girls

3175	
- 2065	
<u>      </u>	- 110
<u>      </u>	<u>      </u>

Amina buys bread, strawberries and cheese.

At the till, she picks up some batteries which were 99p more than the cheese.

She pays with a £20 note.

How much change should she receive?



£1.35



£1.99



£3.50



£?

£20				
£1.35	£1.99	£3.50	£0.99	£3.50

# Using bar models for word problems: addition and subtraction



## HAVE A GO!


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

-  1) 4817 people went to a fireworks display in Haywards Heath and 3496 went to one in Worthing.
- How many more went to Haywards Heath?
  - How many people went to both displays altogether?
-  2) Surinder and Tufeer raise some money for charity. Surinder raises £1289 and Tufeer raises £175 more.
- How much did Tufeer raise?
  - How much did they raise altogether?
-  3) Daniel is writing a story. On day 1 he writes 780 words. On day 2 he writes 99 words less than day 1. The next day he writes 1025 words.
- How much more does he write on day 3 than day 2?
  - How many words has he written altogether?
-  4) There were 2085 people at the airport. 1295 of these people were about to depart and the rest had arrived. There were 500 more people arriving with souvenirs than without. How many people didn't bring a souvenir home?
-  5) A lift can carry a maximum weight of 1134kg. 9 people weighing 675 kg are in the lift and 4 more people weighing 302kg get in. What is the weight allowance left?
-  6) A group of friends want to plant 3065 Christmas trees. At the end of the day, they have planted 197 less than their target. Bill planted 815, Niamh planted 679, Siobhan planted 725 and Sarah planted the rest. How many trees did Sarah plant?






## PRACTICE WITH ME

15 tickets to a VIP basketball game are sold for £195 each. 

How much is made in ticket sales?

There are 15 biscuits in a packet. Mrs Flinders orders 125 packets for a coffee morning.

How many biscuits will there be altogether? 


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


1) In a month, a farmer sells 33 truck-loads of potatoes. Each truck carries 515 potatoes.

How many potatoes are sold in a month?


2) A vlogger get an average of 12,058 likes on every video they post. They post 7 videos a week. 

How many likes do they get every week?


3) It takes 16 hours for a satellite to orbit around the Earth once. How many hours would it take to orbit 2355 times? 

4) Every month, a farmer sells 2016 trays of eggs. How many eggs are sold in a year? 

## PRACTICE WITH ME


Marc waters some plants. He gives each plant 50 millilitres of water. 


After 14 plants he has 30ml left. How much water did he start with?

Amy sold 20 cakes for £1.50 each. She had to pay £3.25 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 20 kilometres for charity. They all completed the journey except for one of the friends, who had to stop 785 metres before the end. What distance did they walk altogether? 

6) Jacob puts up a shelf which will hold 1.75kg (1750g). He puts 4 books on the shelf, which weigh 250g each and 2 trophies that weigh 50g each. How much of the weight limit is left on the shelf? 

7) Each table in the lunch hall sits 12 children. One lunchtime, 11 of the tables are full but there are only 8 children on the 12th table. How many children are eating lunch? 

8) Tickets to a West End show are £125 each with a one off booking fee of £4.99 for each group of tickets sold. A drama club buys 13 tickets. How much do the tickets cost? 





## PRACTICE WITH ME



A vlogger received 339 views on a video they posted from Monday to Friday.

Over the weekend their video was viewed another 347 times.



**What is the average daily view of the video?**

A local charity has 3 fundraising events. The events raise £199, £73 and £259 each.



The money is shared equally among 6 local charities. **How much does each group receive?**

154 people turn up to a football match. Each stand can fit 12 people in.



**a) How many stands are needed? b) How many stands are full?**

Hetty bakes 118 cupcakes for a cake sale. She creates gift-boxes of 6 cupcakes.



**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

Q1) Anna has a collection of football cards which she keeps in a folder with 9 cards on each page. Anna has 15 packs of 7 cards to put into her folder.



**a) How many pages in her folder are full? b) How many cards are on the last page?**

Q2) A pencil factory makes 517 pencils in one hour, but 37 are found to be faulty.



The pencils are sold in packs of 12. **How many packs will be filled by the non-faulty pencils?**

Q3) Daffodils are arranged into bunches of 8 flowers. A florist receives a delivery of 700 daffodils but 28 have been damaged and can't be sold. **How many bunches of 8 daffodils can be made?**



Q4) A local youth club has £255 in their account. They want to purchase some new painting sets which cost £9 each. **a) How many painting sets can they buy? b) What will they have left in their account?**



Q5) Year 5 are going on a school trip and need to book some mini-buses. Each minibus holds 16 passengers. There are 60 children and 8 adults. **How many mini-buses are needed?**



Q6) Imran sells 32 t-shirts for £5 and Esa sells 18 t-shirts for £6. The money they raise is to be shared between 4 charities. **How much money will each charity receive?**



Q7) Each table in the lunch hall sits 8 children but there are only 9 tables. Each table is given 15 minutes to eat. There are 360 children waiting to eat.

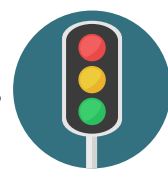


**a) How many tables are needed? b) How long will it take for everybody to finish their lunch?**

Q8) Stephen and Barbara pick 115 strawberries on a farm. A punnet holds 11 strawberries.



**a) How many full punnets do they have? b) How many strawberries in the non full punnet?**





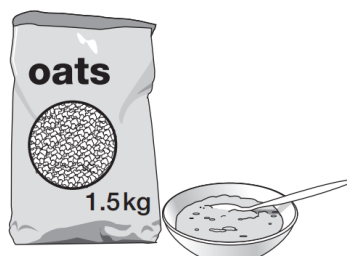
scan

## PRACTICE WITH ME



### 2016 Paper 2 Q11

A packet contains 1.5 kg of oats.



Every day Maria uses 50g of oats to make porridge.

How many days does the packet of oats last?

### 2016 Paper 2 Q19

Miss Mills is making jam to sell at the school fair.

Strawberries cost £7.50 per kg.

Sugar costs 79p per kg.

10 glass jars cost £6.90

She uses 12 kg of strawberries and 10 kg of sugar to make 20 jars full of jam.

Calculate the total cost to make 20 jars full of jam.

### 2016 Paper 3 Q6

Jacob cuts 4 metres of ribbon into **three** pieces.

The length of the first piece is **1.28** metres.

The length of the second piece is **1.65** metres.

Work out the length of the third piece.

Olivia buys three packets of nuts.



She pays with a **£2 coin**.

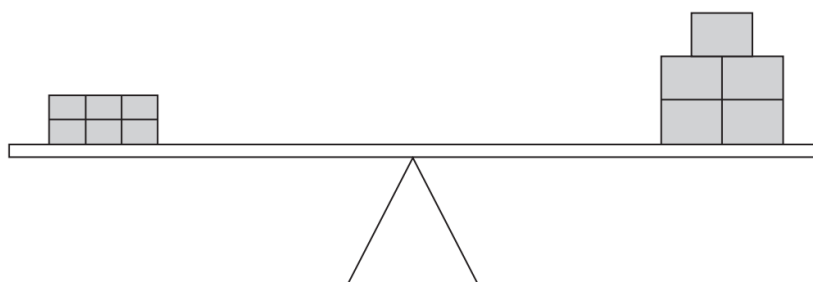
This is her change.



What is the cost of **one** packet of nuts?

### 2016 Paper 3 Q16

6 small bricks have the same mass as 5 large bricks.



The mass of one small brick is 2.5 kg.

What is the mass of one large brick?

### 2016 Paper 3 Q20

Lara had some money.

She spent £1.25 on a drink.

She spent £1.60 on a sandwich.

She has **three-quarters** of her money left.

How much money did Lara have to **start with**?

scan



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

Q1) A jug has 4 litres of squash. Jason pours out 500ml into a glass for himself. He pours the rest of the jug into glasses of 250ml.

**How many glasses of squash are there?**

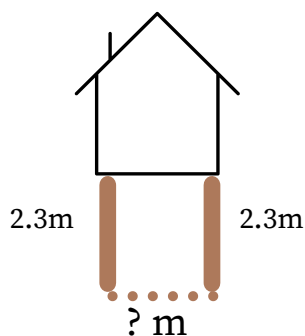


Q2) Mr Harper is making cupcakes to sell at the school fair.

Cupcake mix costs £1.50 per 100g. Cupcake toppers £5 for 12. Cupcake cases cost £8.00 for 24.

He uses 2.5kg of cupcake mix to make 48 cupcakes. He uses a cupcake topper and case for each cupcake.

**How much does he spend?**



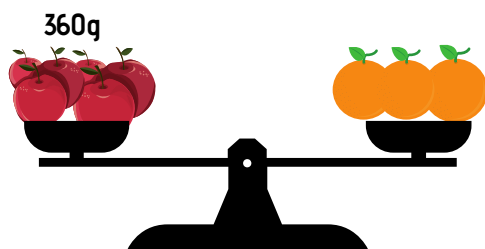
Q3) Mina needs to put up 6 metres of fence. She has put up 2.3 metres of fence down each side of her garden.

**What is the length of fence she needs for the back of her garden?**

Q4) Jaden buys a bunch of five bananas. He pays with £5.

This is his change.

**What did one banana cost?**



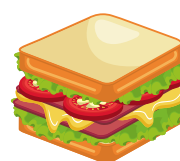
Q5) 6 apples weigh the same as 4 oranges.

**How much does 1 orange weigh?**

Q6) Scott spends 75p on a packet of crisps and £2.25 on a sandwich.

He still has  $\frac{1}{4}$  of his money left to spend on a drink.

**How much money did Scott start with?**





At a fair the big wheel has 63 cabins. Each cabin fits two people. If  $\frac{6}{9}$  of the cabins are fully occupied **how many people are on the big wheel?**

A candle is 35 cm tall. After burning for 4 hours its height has decreased by  $\frac{4}{5}$ . What is its new height?

20

On Saturday Lara read  $\frac{2}{5}$  of her book.

2016 Paper 3 Q20



On Sunday she read the **other** 90 pages to finish the book.

How many pages are there in Lara's book?

Show  
your  
method

pages

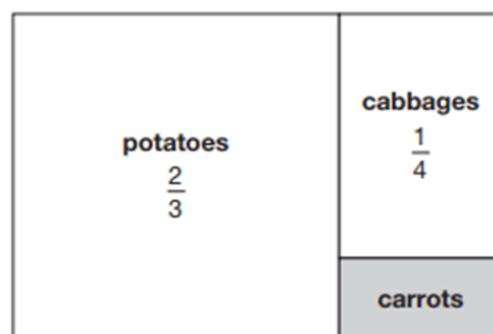
scan



This is a diagram of a vegetable garden.

2016 Paper 3 Q16

It shows the fractions of the garden planted with potatoes and cabbages.



Not to scale

The remaining area is planted with carrots.

What **fraction** of the garden is planted with carrots?

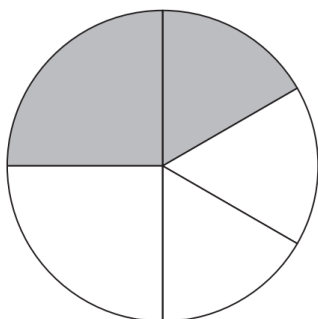


**HAVE A GO- use some paper to show your working out**

scan

- 1) At a park the mini-train has 20 cabins. Each cabin seats 4 people. If  $\frac{7}{8}$  of the cabins are full, **how many seats are empty?**
- 2) A jug has 950ml of squash inside. After 2 hours  $\frac{6}{10}$  has been poured out. **How much squash is there left ?**
- 3) Emily and Timothy are reading the same book it has 450 pages Emily has got  $\frac{2}{5}$  of the way through. Timothy has got  $\frac{7}{10}$  of the way through. **Who has read more pages?**
- 4) There are 115 parking spaces in the car park. When Mrs Taylor visits  $\frac{4}{5}$  of the spaces are used. **How many parking spaces are free?**
- 5) Amir spent  $\frac{4}{6}$  of 120 minutes revising for a test. Eva spent  $\frac{3}{5}$  of 150 minutes revising for a test. **Who revised for the longest time?**

In this circle,  $\frac{1}{4}$  and  $\frac{1}{6}$  are shaded.



What fraction of the whole circle is **not** shaded?

6)

**Can you use this bar to solve the problem?**

--	--	--	--	--	--	--	--	--	--	--	--	--



## ANSWERS

### Page 4

Q1a) 1321      1b) 3496      Q2a) £1464      2b) £2753

Q3a) 344      Q3b) 2486      Q4) 290      Q5) 157kg      Q6) 649

### Page 5

Q1) 16,995      Q2) 84,406      Q3) 37,360      Q4) 24,192

Q5) 239,215 metres      Q6) 650g      Q7) 140      Q8) £1629.99

### Page 6

Q1a) 11 full pages      Q1b) 6 cards      Q2) 40 packs      Q3) 84 bunches

Q4a) 28 sets      Q4b) £3 left      Q5) 5 minibuses      Q6) £67

Q7a) 45 tables      Q7b) 75 mins/1h 15mins      Q8a) 10 punnets      Q8b) 5

### Page 8

Q1) 14 glasses      Q2) £73.50      Q3) 1.4 m

Q4) 22p      Q5) 90g      Q6) £4

### Page 10

Q1) 10 empty seats      Q2) 380ml      Q3) Timothy

Q4) 23 free spaces      Q5) Amir

Q6) 

--	--	--	--	--	--	--	--	--	--	--	--	--

 $\frac{7}{12}$  is not shaded