

Maths Café

27.2.2019

Bar Modelling



Making connections

Make it

Draw it

Write it



If the *orange* value is 10 what is....

The white?

The red?

The light green?

Etc...



We can change the *orange* value to represent any number, for example

Orange = 20

Orange = 50

Orange = 75



Recording

It is important **(at some point)** to show children that **y** does not always equal yellow!

What if red = a, yellow = b, green = c



What's the value?

Make a picture with the rods.

Work out the value of the rods (using values of your choice).

Give the picture to a friend, with the total.

Can they work out each value of the rods?



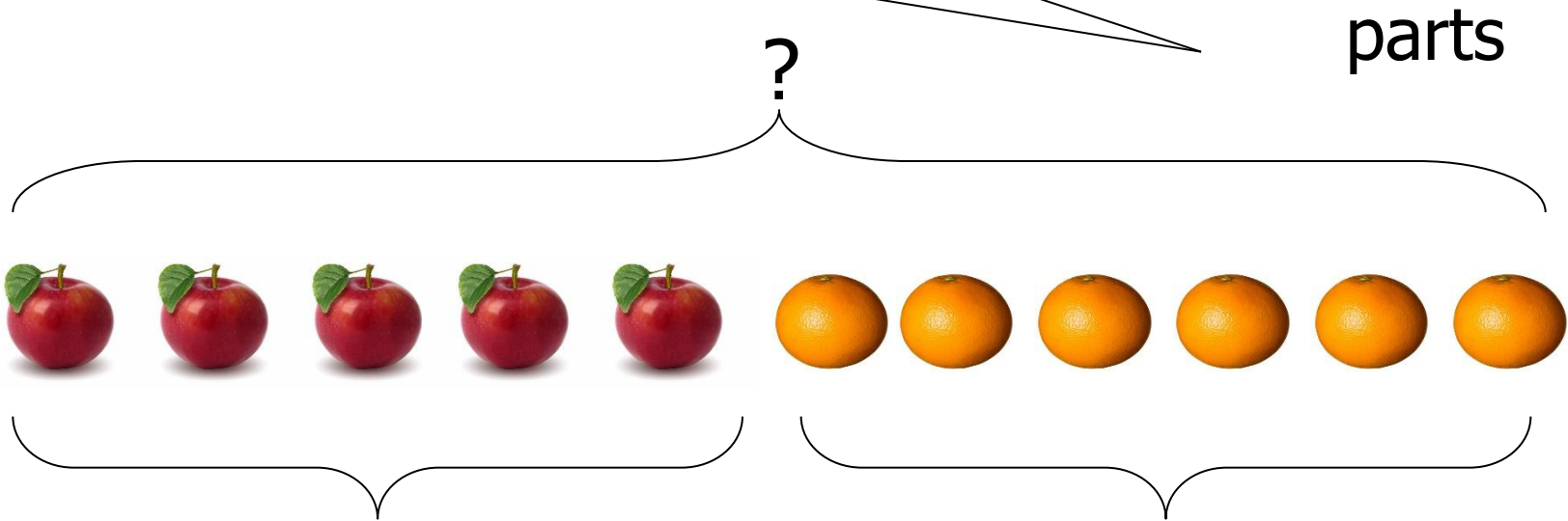
Mathematical problems always:

- contain **part and whole relationships.**
- contain **knowns and unknowns**



Part-whole model for addition and subtraction

There are 5 apples and 6 oranges. How many pieces of fruit altogether?

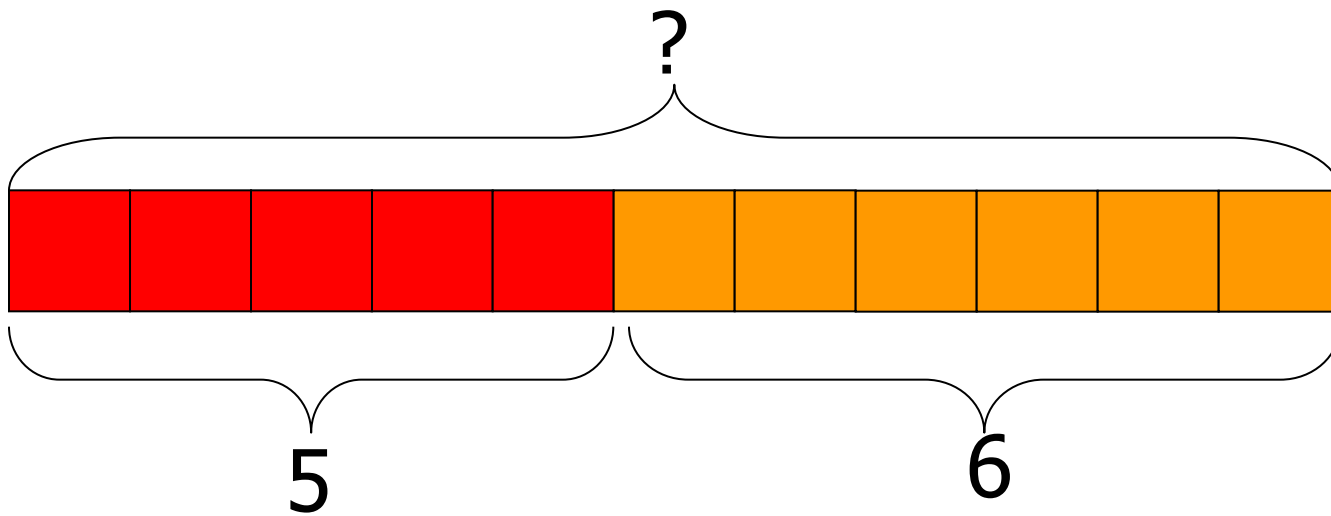


Concrete 5



Part-whole model for addition and subtraction

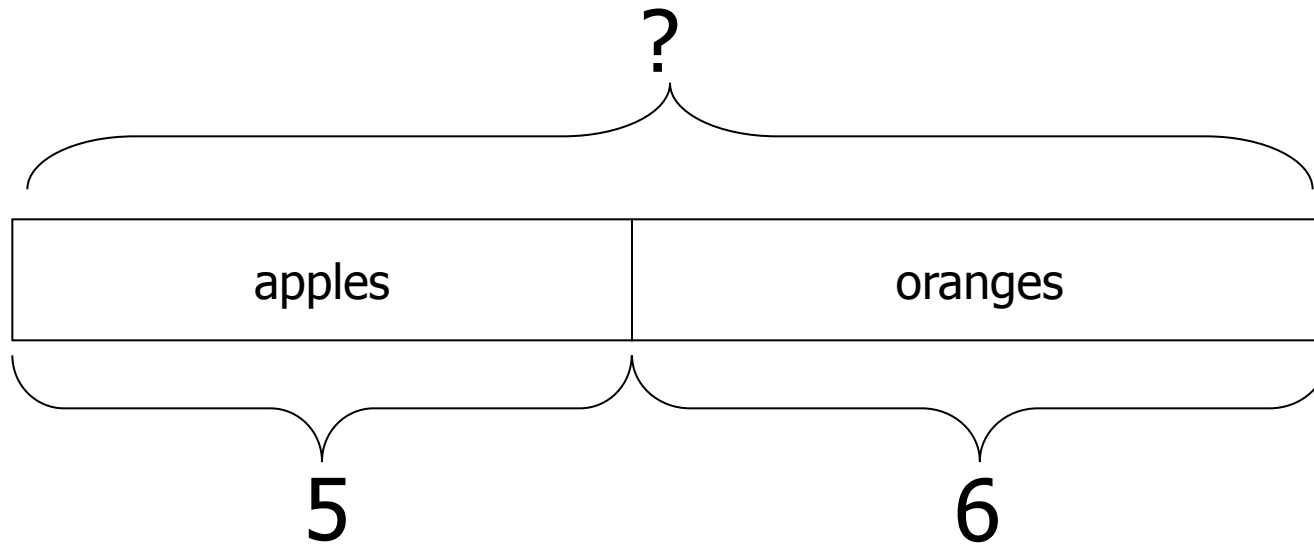
There are 5 apples and 6 oranges. How many pieces of fruit altogether?



Pictorial



Part-whole model for addition and subtraction



Abstract

$$5 + 6 = 11$$



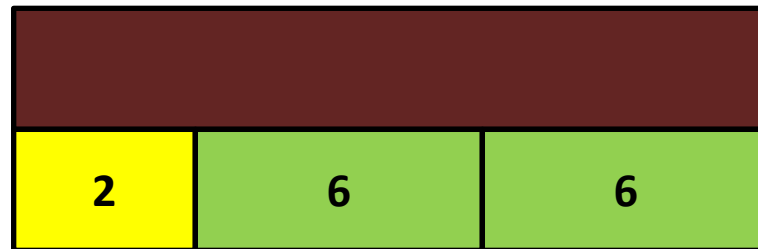
Ella has some cherries. She eats 2. Then she eats half of what is left. She now has 6. How many did she have to begin with?

- Identify the 'knowns' and 'unknowns'.
- Label the 'known' parts and/or wholes
- Label the 'unknown' parts and/or wholes
- Write the number sentence/equation



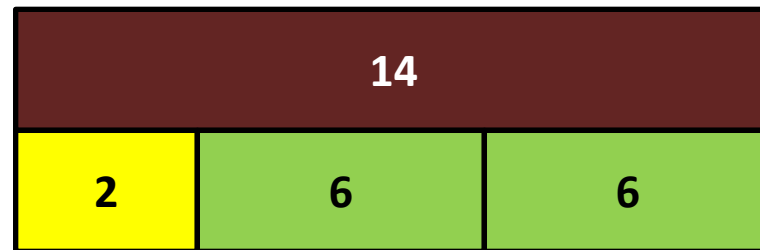
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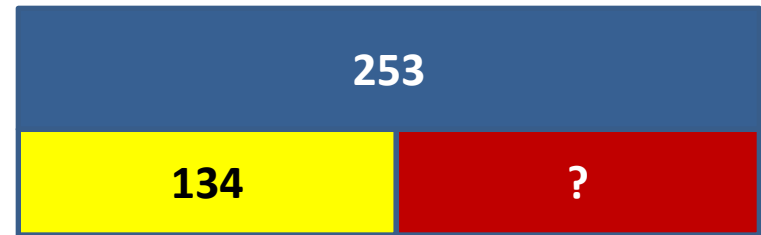
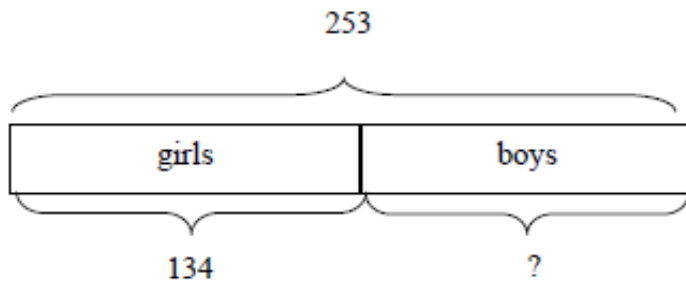


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There are 134 girls in Middletown School. If there are 253 children at the school altogether, how many boys are there?



We know the whole and one of two parts.

To find the missing part, we subtract.

$$253 - 134 = 119$$



KS2 2012

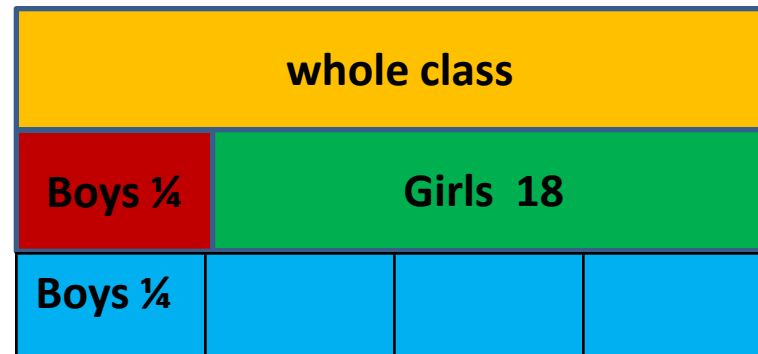
24

In a class, 18 of the children are girls.

A quarter of the children in the class are boys.

Altogether, how many children are there in the class?

Show
your
working

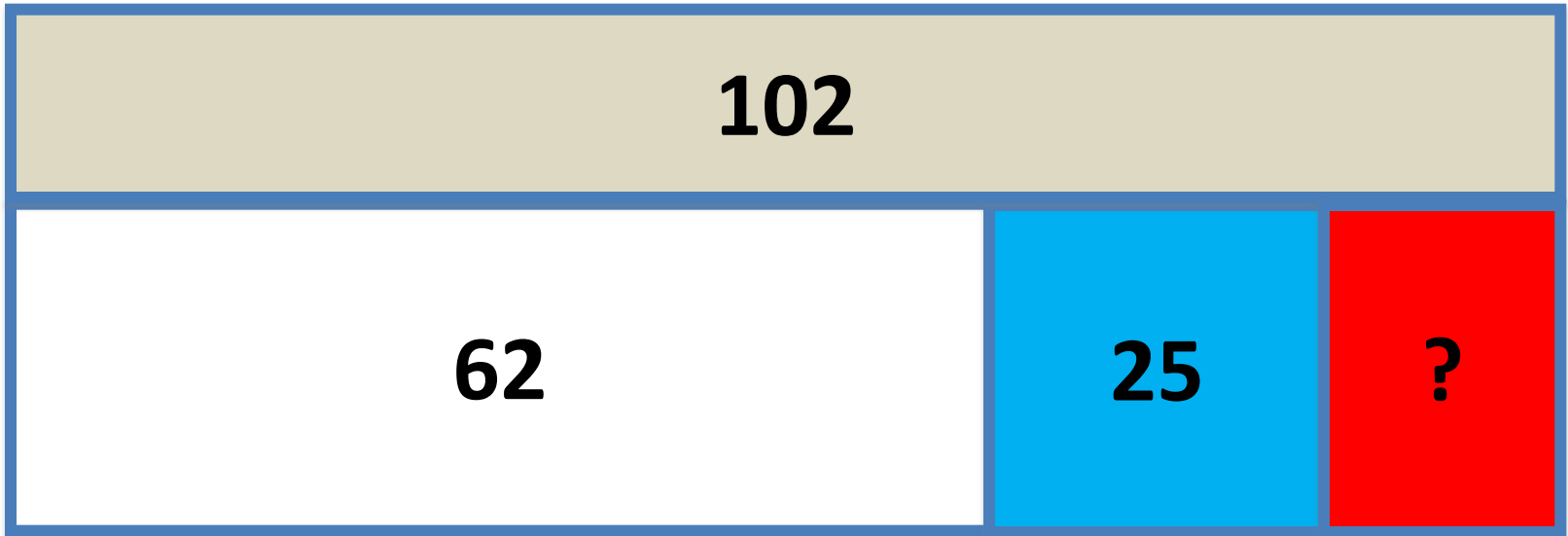


Balloons



Kendra has 102 balloons. 62 of them are white and 25 balloons are blue. The rest of the balloons are red. How many red balloons does Kendra have?



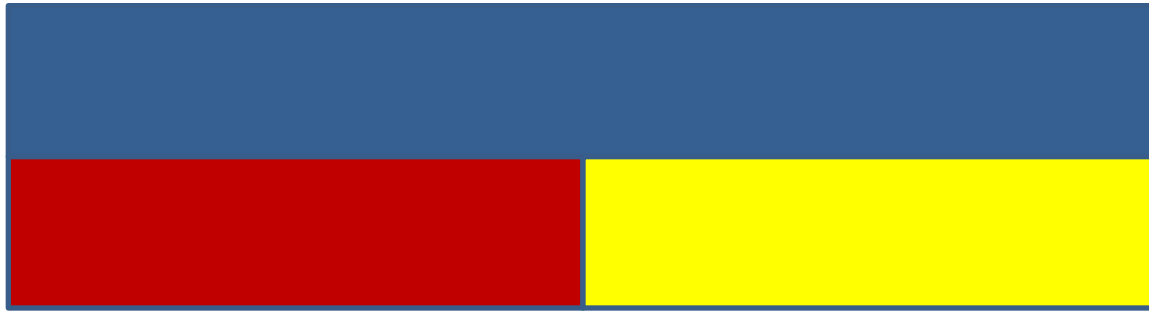


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Generalisation

Whole - unknown



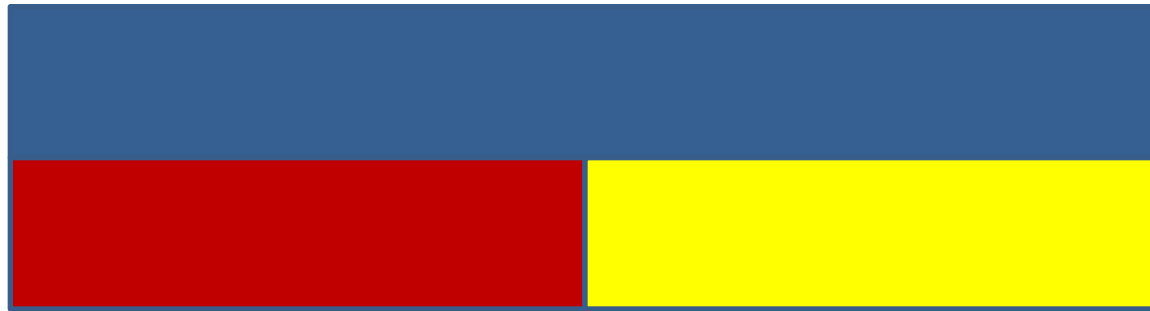
part - known

part - known



Generalisation

Whole - known



part - known

part - unknown





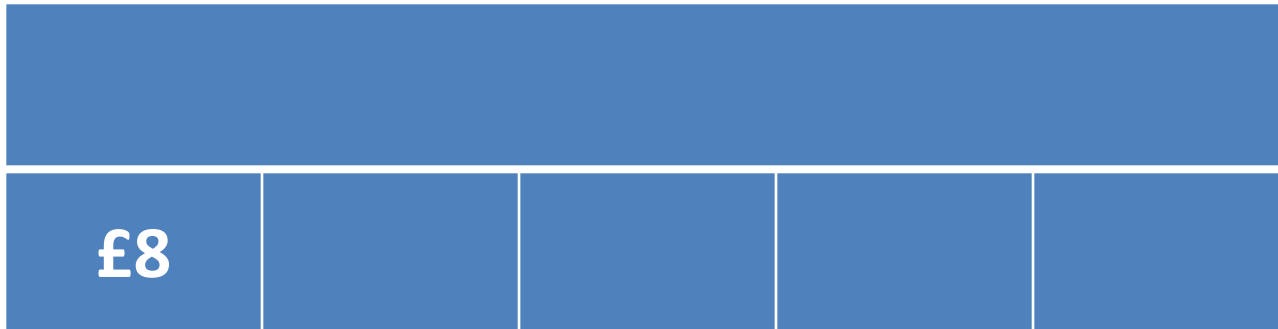
$$\begin{aligned} a - b &= c \\ a - c &= b \\ b + c &= a \\ c + b &= a \end{aligned}$$

This generalisation can then help the children solve, for example, missing number problems using the bar model approach:

$$45 + ? = 93, ? - 62 = 13, 146 - ? = 79, ? + 82 = 147$$



Part-whole model for multiplication and division

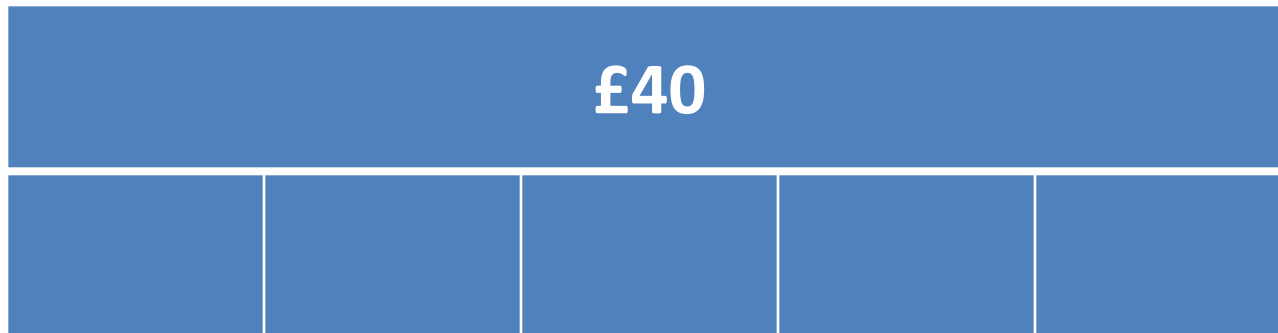


Sam saved £8 a week for 5 weeks. How much did he save altogether?

We know 1 part and the number of parts, so we multiply to find the total.



Part-whole model for multiplication and division

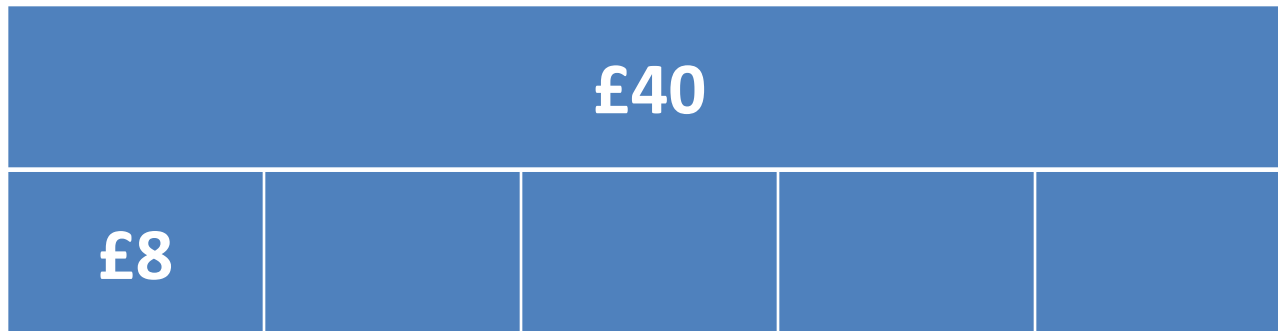


Sam saved £40 in 5 weeks. How much did he save each week?

We know the whole and the number of parts, so we divide to find the value of one part.



Part-whole model for multiplication and division



Sam saved £8 each week. How many weeks did it take him to save £40?

We know the whole and the value of one part, so we divide to find the number of parts.



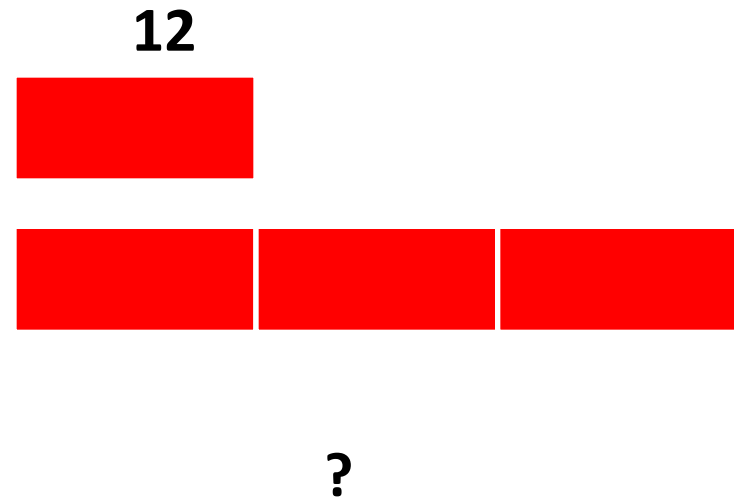
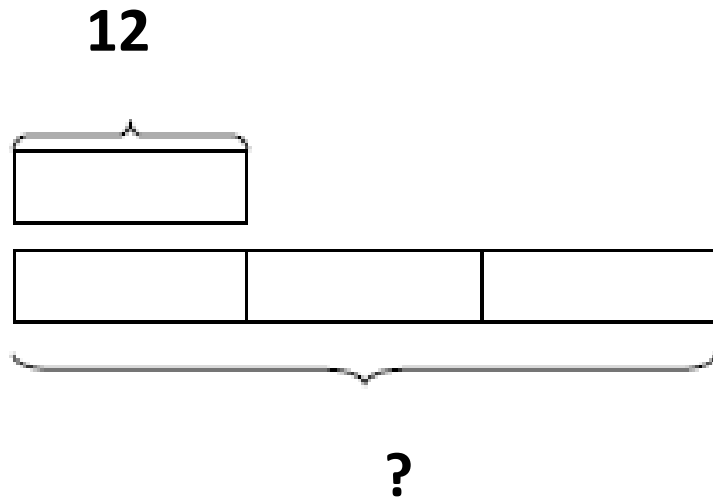
Part-whole model for multiplication and division

**Have a go at some questions – can you use
a CPA approach?**



Fractions, ratios and comparisons

There are 12 white flowers. There are 3 times as many yellow flowers as white flowers. How many yellow flowers are there?

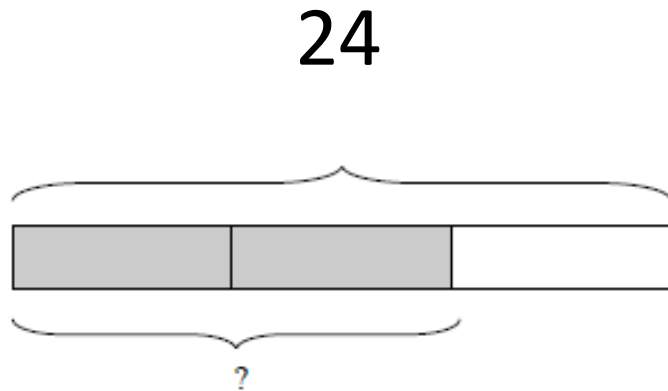


One quantity is a multiple of the other. To find how many yellow flowers, we multiply 12 by 3.



Fractions, ratios and comparisons

George buys 24 flowers. $\frac{2}{3}$ of them are red, the rest are white. How many white flowers did he buy?



One quantity is a fraction of the other. To find how many white flowers, we divide by 3.



**Ann has £240. She spends $\frac{5}{8}$ of it.
How much does she have left?**

£240



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How much does she have left?



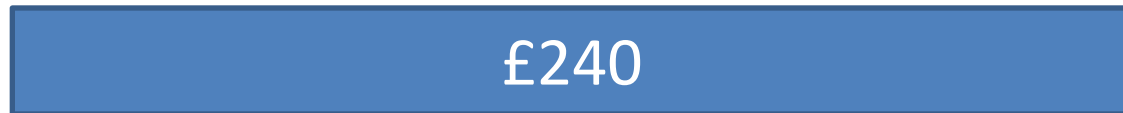
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Ann has £240. She spends $\frac{5}{8}$ of it.
How much does she have left?



£90



Increase £45 by $\frac{1}{5} = 54$.



I like to do these with the bars, I find it much easier as it is laid out clear for me to understand.

