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# Singapore Math Bar Model Strategy

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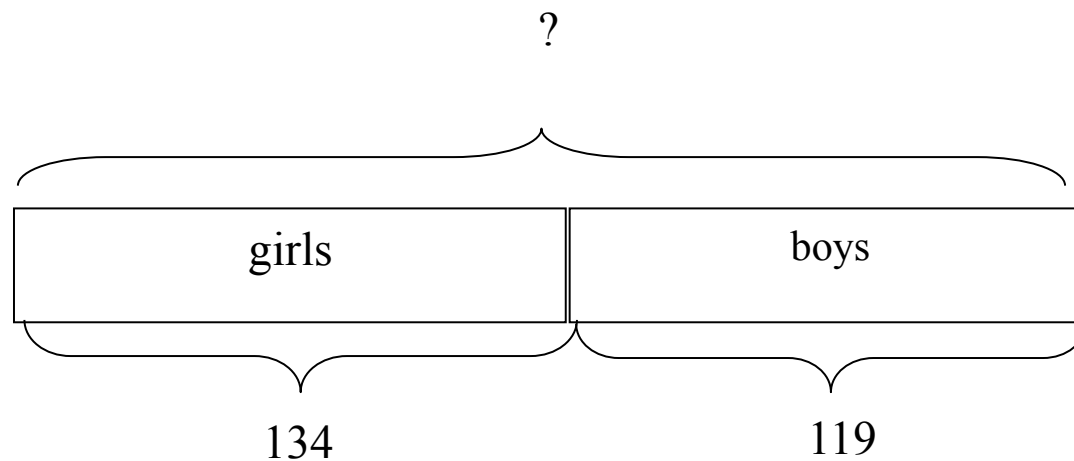
# **Part-Whole Model for Addition and Subtraction**

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134 girls and 119 boys took part in an art competition. How many children took part in the competition?

- We know the 2 parts. To find the whole, we add  $134 + 119$ .



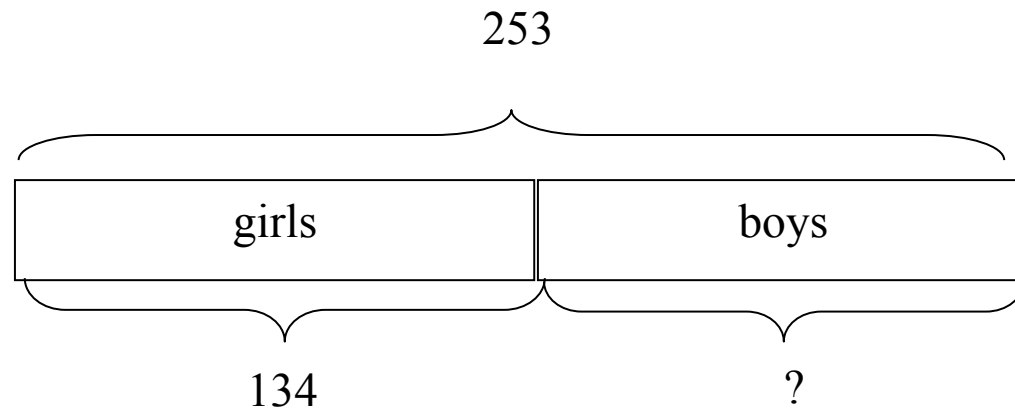
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This problem and the following problems are taken from  
Primary Mathematics, Marshall Cavendish, publisher

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253 children took part in an art competition. There are 134 girls. How many boys are there?

- We know the whole and 1 part. To find the missing part, we subtract  $253 - 134$ .



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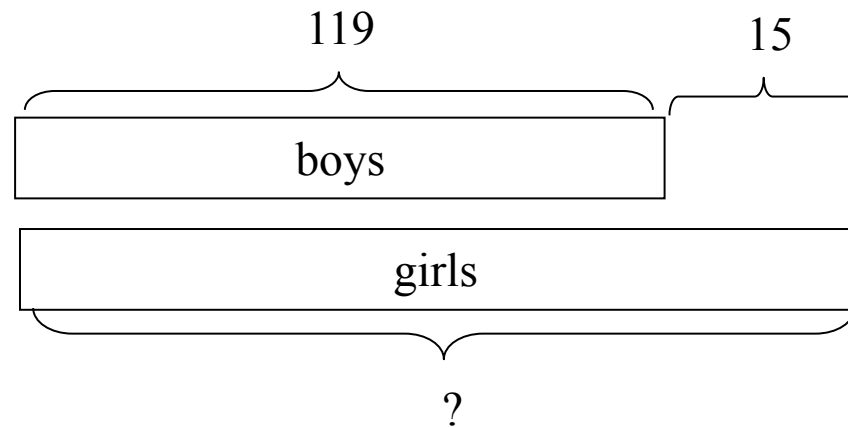
# Comparison Model for Addition and Subtraction

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119 boys took part in an art competition. 15 more girls than boys took part. How many girls took part in the competition?

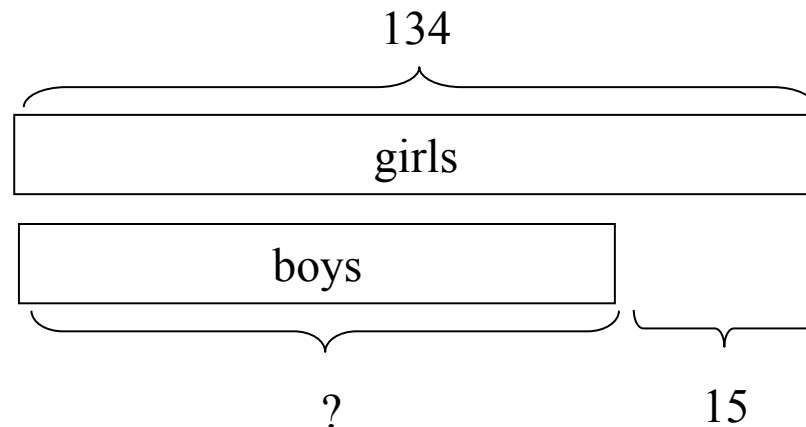
- We are comparing the boys to the girls. We know the smaller quantity. To find the bigger quantity we add  $119 + 15$ .



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134 girls took part in an art competition. 15 fewer boys than girls took part. How many boys took part in the competition?

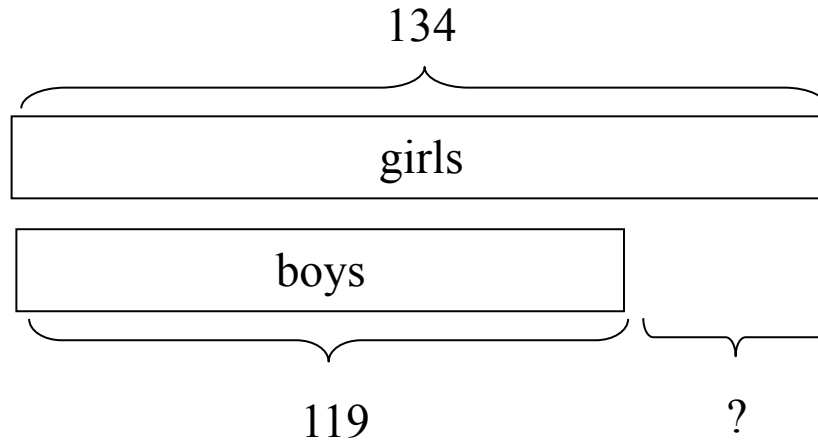
- We are comparing the girls to the boys. We know the bigger quantity. To find the smaller quantity we subtract  $134 - 15$ .



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134 girls and 119 boys took part in an art competition. How many more girls than boys took part in the competition?

- We are comparing the girls to the boys. To find the difference we subtract  $134 - 119$ .





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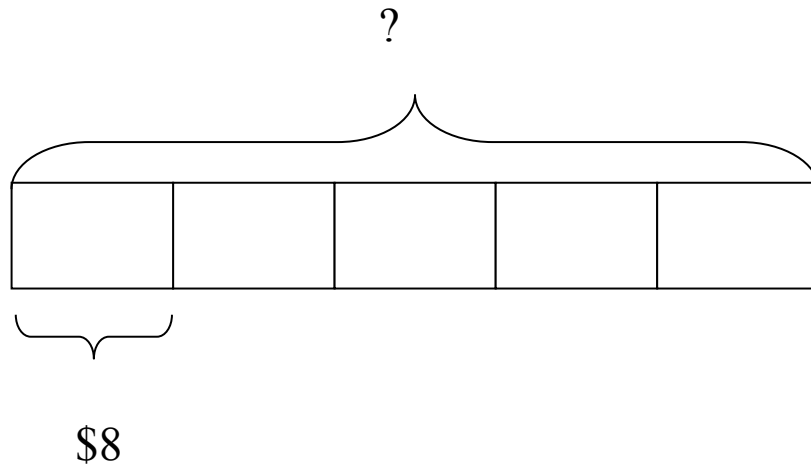
# **Part-Whole Model for Multiplication and Division**

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Devi saved \$8 a week for 5 weeks. How much did she save altogether?

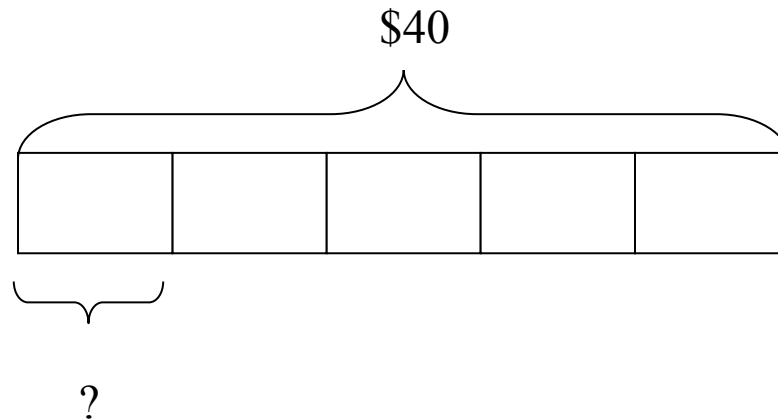
- We know 1 part and the number of parts. To find the whole we multiply  $8 \times 5$ .



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Devi saved \$40 in 5 weeks. How much did she save each week?

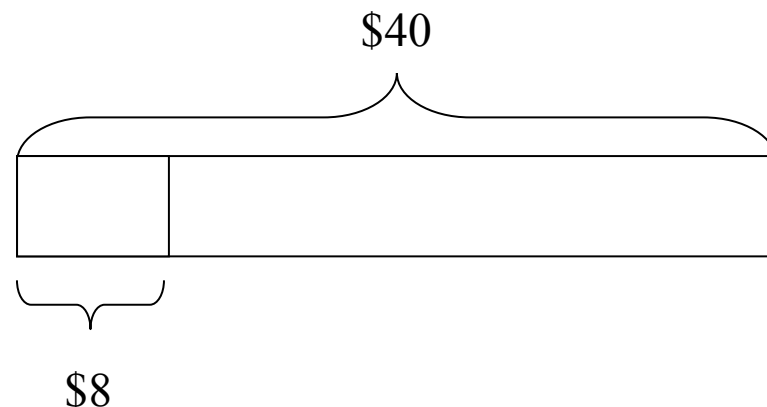
- We know the whole and the number of parts. To find one part we divide  $40 \div 5$ .



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Devi saves \$8 each week, How many weeks will it take her to save \$40?

- We know the whole and one part. To find the number of parts we divide  $40 \div 8$ .



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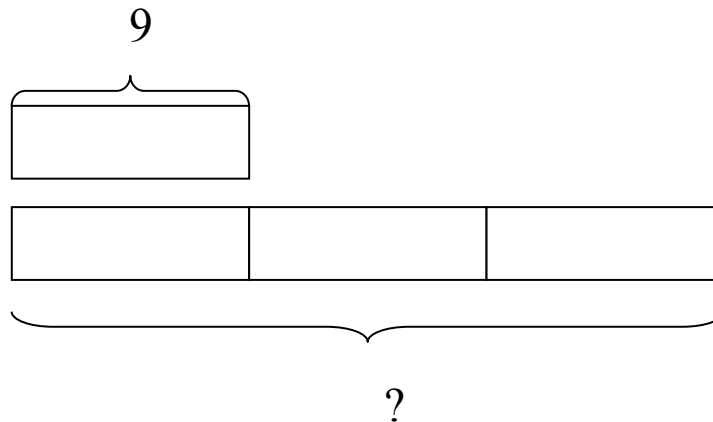
# Comparison Model for Multiplication and Division

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There are 9 white flowers. There are 3 times as many red flowers as white flowers. How many red flowers are there?

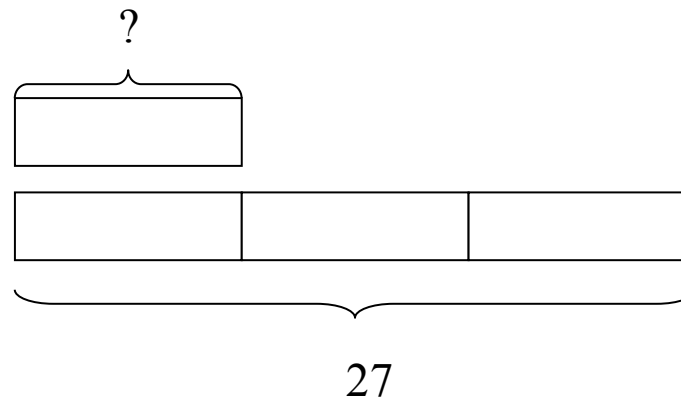
- Two quantities are compared. One is a multiple of the other. We know the smaller quantity. To find the bigger quantity we multiply  $9 \times 3$ .



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There are 27 red flowers. There are 3 times as many red flowers as white flowers. How many white flowers are there?

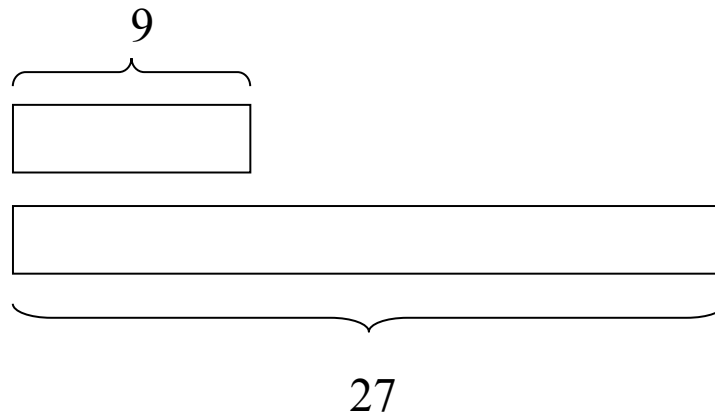
- Two quantities are compared. One is a multiple of the other. We know the bigger quantity. To find the smaller quantity we divide  $27 \div 3$ .



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There are 27 red flowers and 9 white flowers. How many times as many red flowers as white flowers are there?

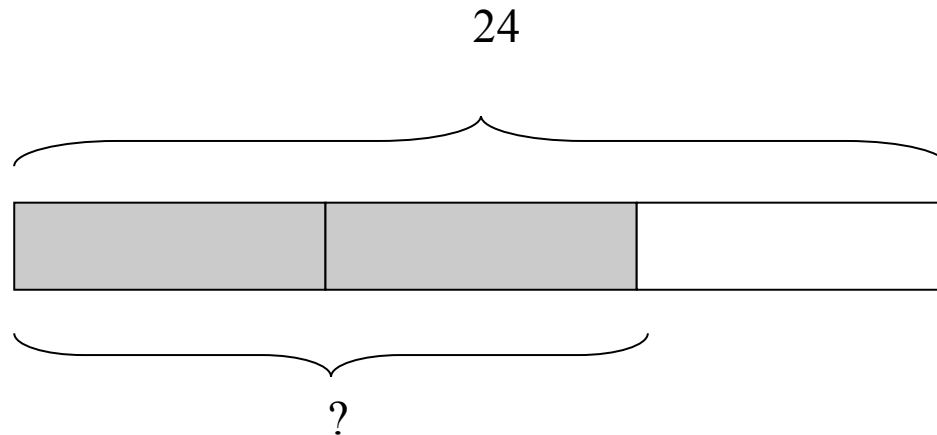
- Two quantities are compared. One is a multiple of the other. We know both quantities. To find the multiplier we divide  $27 \div 9$ .





## Fraction models

Kelley buys 24 flowers.  $\frac{2}{3}$  of them are white.  
How many white flowers are there?



### Try one!

- *David spent  $\frac{2}{5}$  of his money on a storybook. The storybook cost \$20. How much money did he have at first?*

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# Tips for using models effectively

- Steps for problem solving

- Understand the problem situation.
- Represent the situation with a model.
- Write an expression and solve.
- Write the answer and look back (check).

- Tips

- Draw bars neatly (sharp pencil)
- Partition bars accurately.

- Use  instead of  .



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How would you solve this problem from the 5<sup>th</sup> grade Singapore textbook?

Mrs. Chen made some tarts. She sold  $\frac{3}{5}$  of them in the morning and  $\frac{1}{4}$  of the remainder on the afternoon. If she sold 200 more tarts in the morning than in the afternoon, how many tarts did she make?

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Mrs. Chen made some tarts.

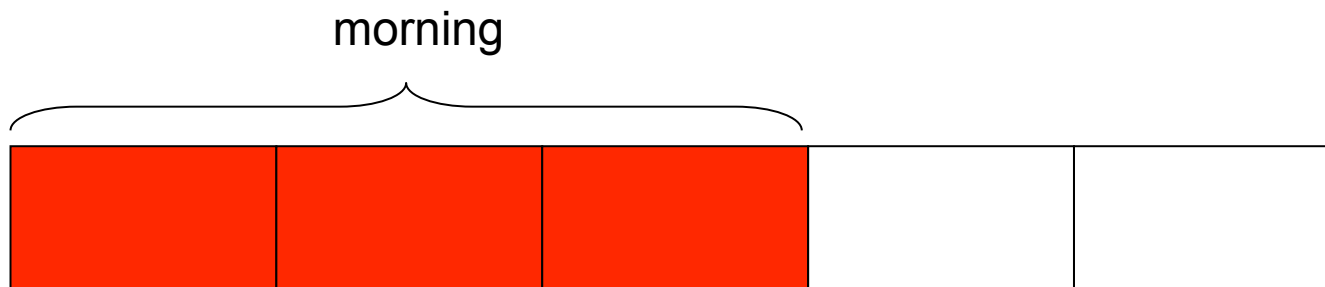


Draw a bar to represent all the tarts.

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She sold  $\frac{3}{5}$  of them in the morning...

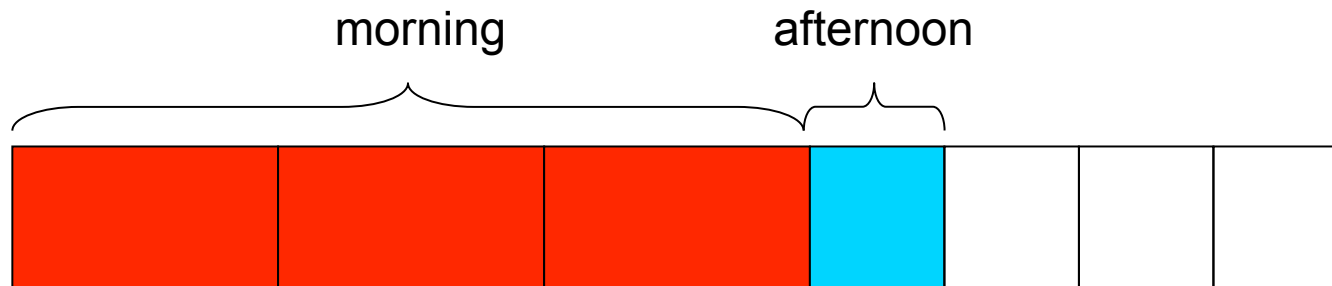


Cut the bar into 5 equal pieces. Shade 3 of them to show the tarts sold in the morning.

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...and  $\frac{1}{4}$  of the remainder in the afternoon.

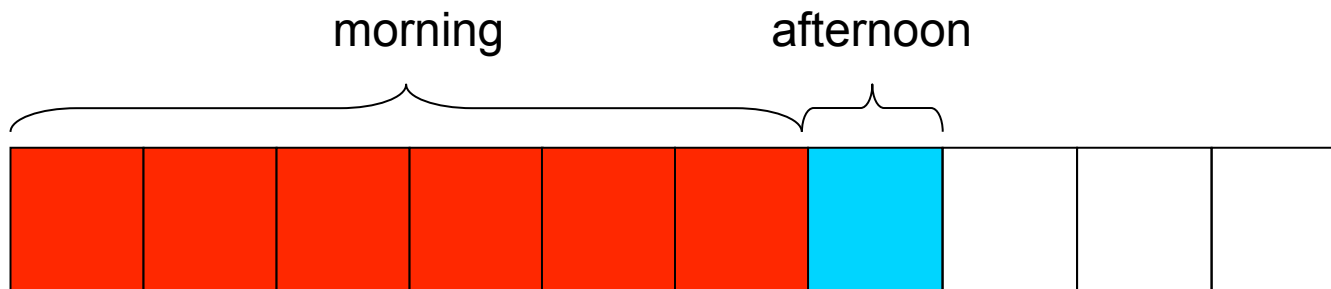


Cut the unshaded part into 4 equal pieces. Shade 1 of them to show the tarts sold in the afternoon.



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...and  $\frac{1}{4}$  of the remainder in the afternoon.

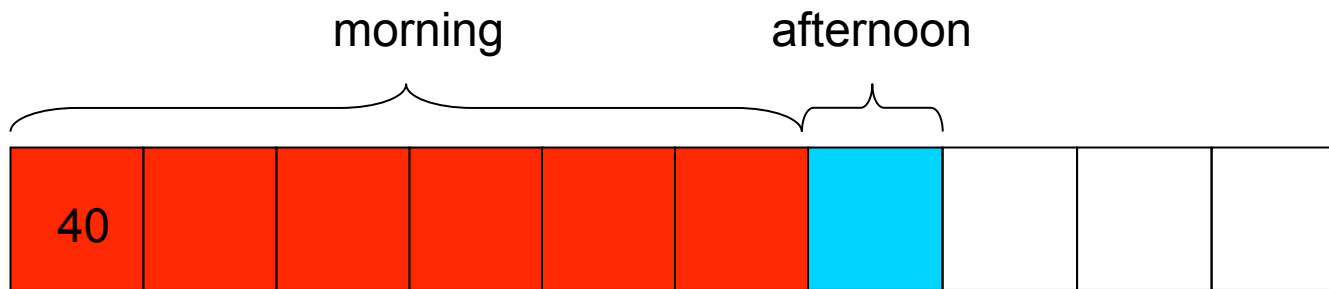


Cut the red boxes in half to make all of the boxes the same size.

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...she sold 200 more tarts in the morning than in the afternoon...



There are 5 more morning boxes than afternoon boxes. We can use the unitary method to find the value of 1 box.

$$5 \text{ units} = 200 \text{ tarts}$$

$$1 \text{ unit} = 200 \div 5 = 40 \text{ tarts}$$

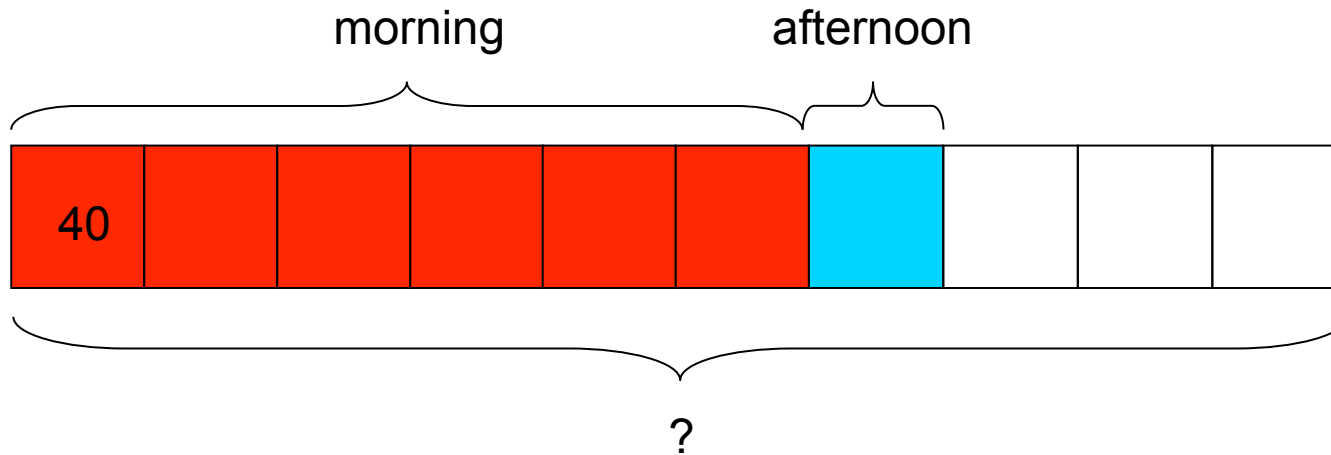
“Unitary” method

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...how many tarts did she make?



There are 10 boxes in all.

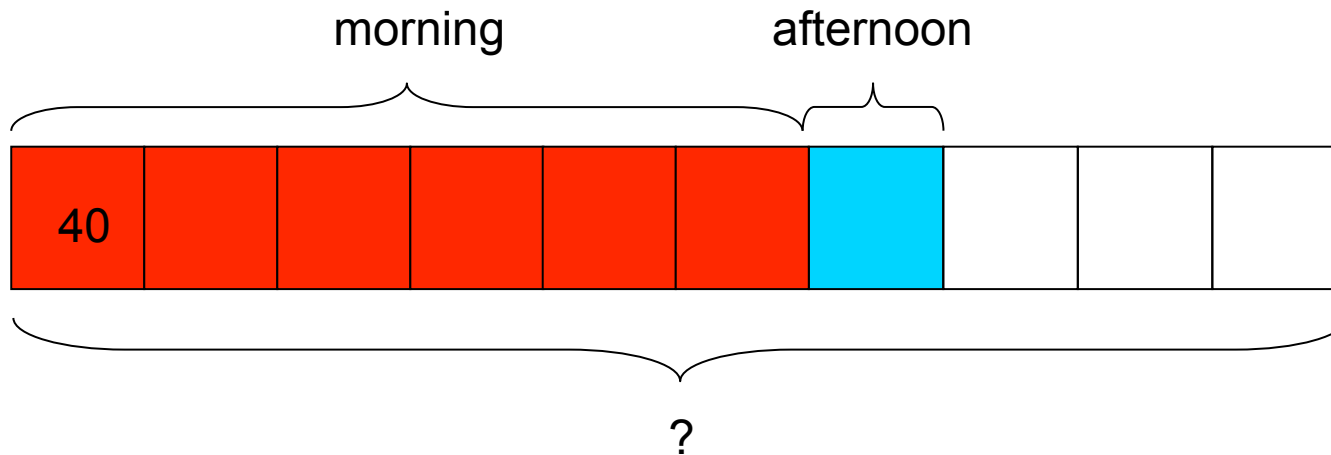
5 units = 200 tarts

1 unit =  $200 \div 5 = 40$  tarts

10 units =  $40 \times 10 = 400$  tarts

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Mrs. Chen made some tarts. She sold  $\frac{3}{5}$  of them in the morning and  $\frac{1}{4}$  of the remainder on the afternoon. If she sold 200 more tarts in the morning than in the afternoon, how many tarts did she make?



Mrs. Chen made 400 tarts.

Expression:  $200 \div 5 \times 10 = 400$