

# Ratio problems

## Notes and guidance

In this small step, children use what they have learnt so far in this block to solve a variety of problems involving ratio.

Children use representations from earlier steps to help them see the multiplicative relationships between ratios. They recognise that when they multiply or divide from one amount to another, they do the same for the other value to keep the ratios equivalent. Children may see that this method is similar to finding equivalent fractions. When using double number lines, children can explore the vertical as well as horizontal multiplicative relationships.

Representing problems using bar models supports the interpretation of word ratio problems. These models can be used for a wide range of question types, such as: “If there are \_\_\_\_\_ blue/red/total, how many blue/red/total are there?” and “If there are \_\_\_\_\_ more red than blue, how many blue/red/total are there?”

### Things to look out for

- Children may confuse the “total” amount for the value of a missing part.
- Children may use additive rather than multiplicative relationships.

## Key questions

- What is the ratio of \_\_\_\_\_ to \_\_\_\_\_?
- If there are \_\_\_\_\_, how many \_\_\_\_\_ must there be?
- If the total number of \_\_\_\_\_ is \_\_\_\_\_, how many \_\_\_\_\_ must there be?
- If there are \_\_\_\_\_ more \_\_\_\_\_ than \_\_\_\_\_, how many are there in total?
- How can you draw a bar model to solve the problem?  
Which parts of the model do you know?  
How can you work out the remaining parts?

## Possible sentence stems

- The ratio of \_\_\_\_\_ to \_\_\_\_\_ is \_\_\_\_\_:\_\_\_\_\_
- I know that \_\_\_\_\_ multiplied/divided by \_\_\_\_\_ is equal to \_\_\_\_\_, so to find out how many \_\_\_\_\_ there are, I need to multiply/divide by \_\_\_\_\_

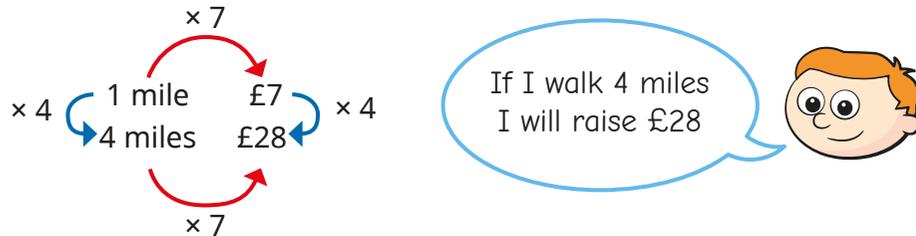
## National Curriculum links

- Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts

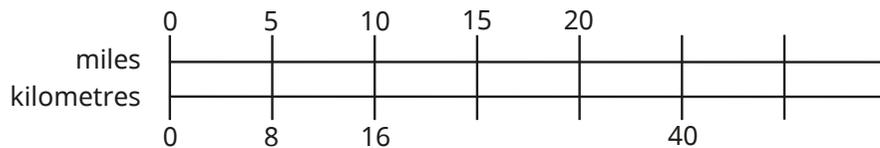
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## Key learning

- Ron is doing a sponsored walk for charity.  
For every mile he walks, he will raise £7

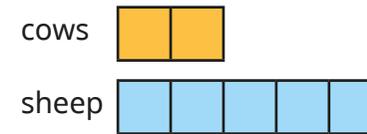


- ▶ How much will Ron raise if he walks 3 miles?
  - ▶ How much will Ron raise if he walks 22 miles?
  - ▶ How many miles will Ron need to walk to raise £42?
- The double number line shows the relationship between miles and kilometres.
  - ▶ Complete the double number line.



- ▶ Complete the statements.  
55 miles = \_\_\_\_\_ km      \_\_\_\_\_ miles = 96 km

- On a farm, for every 2 cows, there are 5 sheep.



Use bar models to answer the questions.

- ▶ If there are 4 cows, how many animals are there altogether?
  - ▶ If there are 35 animals altogether, how many cows are there?
  - ▶ If there are 50 sheep, how many cows are there?
  - ▶ If there are 12 cows, how many more sheep are there than cows?
- In a car park, there are 4 blue cars for every 7 red cars.
  - ▶ If there are 20 blue cars, how many red cars are there?
  - ▶ If there are 28 red cars, how many blue cars are there?
  - ▶ If there are 22 cars in total, how many of them are blue?
  - ▶ If there are 12 blue cars, how many more red cars are there than blue cars?
  - ▶ If there are 30 more red cars than blue cars, how many cars are there in total?

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## Reasoning and problem solving

At a football match, the ratio of home fans to away fans is 7 : 2

Home fans	Away fans
7	2
14	4
21	6
28	8

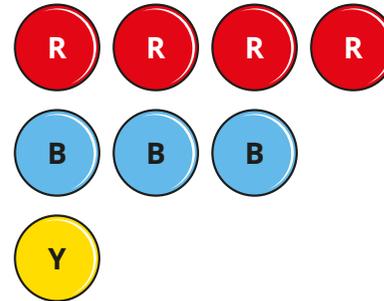
This means that if there are 200 away fans, there are 700 fans in total.



Do you agree with Tiny?  
Explain your answer.

No

The ratio of red to blue to yellow counters is 4 : 3 : 1



If there are 148 red counters, how many yellow counters are there?

If there are 50 more blue counters than yellow counters, how many red counters are there?

If there are 608 counters in total, how many of them are red?

How did you work this out?

Compare answers with a partner.

37

100

304