# Ratio and fractions

## Notes and guidance

In this small step, children explore the differences and similarities between ratios and fractions.

Children may have already noticed that simplifying ratios is similar to simplifying fractions and that both involve dividing by common factors. A possible misconception is thinking, for example, that the ratio 1 : 2 is the same as $\frac{1}{2}$. Exploring links between ratios and fractions using representations such as counters and bar models can help to overcome this. The key point is that a ratio compares one item with another, whereas fractions compare each part with the whole.

Children then explore ratio when given a fraction as a starting point. For example, they are told that $\frac{1}{4}$ of a group of objects is blue, and they need to find the ratio of blue to not blue. Initially, they may think the ratio is 1 : 4, but concrete resources and diagrams can support them to see it is 1 : 3

## Things to look out for

- Children may not consider the whole when linking ratios and fractions. For example, they may think the 2 in 2 : 3 is $\frac{2}{3}$ rather than $\frac{2}{5}$

## Key questions

- What is the ratio of one part to another?
- How many parts are there altogether?
- What fraction of the whole is the first/second/third part?
- How are fractions and ratios similar? How are they different?
- What fraction does the ratio 1 : 2 mean? Is this the same as $\frac{1}{2}$ or is it different?
- How can you represent the ratio/fraction as a bar model?

## Possible sentence stems

- The ratio of _____ to _____ is _____ : _____

  There are _____ parts altogether.

  The fraction that is _____ is _____

## 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
- Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

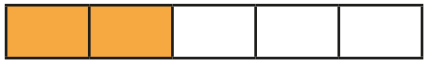
# Ratio and fractions

## Key learning

- The ratio of red counters to blue counters in a box is 1 : 2


  - What fraction of the counters are blue?
  - What fraction of the counters are red?
  - What is the same about the ratio and the fractions? What is different?

- This bar model represents $\frac{2}{5}$



This bar model represents 2 : 5

What is the same and what is different about the bar models?

- Use the diagram to complete the sentences.


The ratio of blue counters to green counters is 2 : _____

The fraction of counters that are blue is $\frac{2}{\square}$

- One third of the chocolates in a box are mint flavoured.

  The rest are strawberry.

  Use diagrams to show that the ratio of mint to strawberry chocolates is 1 : 2

- The bar model shows the ratio 2 : 3 : 4


  - What fraction of the bar is pink?
  - What fraction of the bar is yellow?
  - What fraction of the bar is blue?

- Esther gets $\frac{2}{5}$ of a packet of 30 sweets.

  Huan shares 70 sweets with his friend in the ratio 2 : 5

  How many more sweets does Huan get than Esther?

- Brett opens a box of buttons and counts the different colours.
  - $\frac{1}{2}$ of them are red.
  - $\frac{1}{3}$ them are green.
  - The rest are yellow.

  What is the ratio of red : green : yellow buttons in the box?

# Ratio and fractions

## Reasoning and problem solving

There are some red and green cubes in a bag.

$\frac{2}{7}$ of the cubes are red.

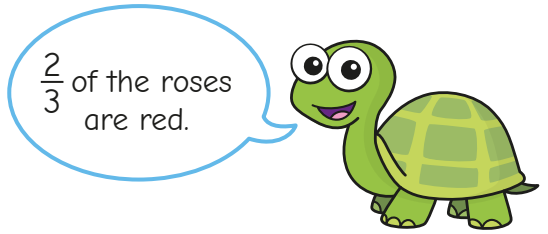
Are the statements true or false?

| | |
|---|---|
| For every 2 red cubes, there are 7 green cubes. | False |
| For every 2 red cubes, there are 5 green cubes. | True |
| For every 5 green cubes, there are 2 red cubes. | True |
| For every 5 green cubes, there are 7 red cubes. | False |

Explain your answers.

Mrs Fisher plants flowers in a flower bed.

For every 2 red roses, she plants 3 white roses.




Is Tiny correct?

Explain your answer.

No

Dani makes 240 ml of squash using cordial and water in the ratio 1 : 3

She adds more water to the cup so there is now 300 ml of squash.

What fraction of the drink is cordial?

$\frac{1}{5}$